



NATIONAL ARBORETUM CONTRIBUTION NO. 2

HISTORY, PROGENY, AND LOCATIONS OF
**CRABAPPLES
OF
DOCUMENTED
AUTHENTIC ORIGIN**

Historic, archived document

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History, Progeny, and Locations
of
Crabapples
of
Documented Authentic Origin

National Arboretum Contribution No. 2

Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

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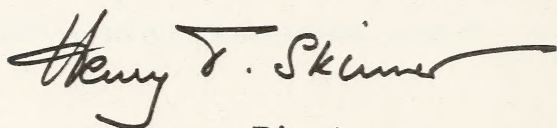
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Foreword

This publication is a continuation of the NATIONAL ARBORETUM CONTRIBUTION series. CONTRIBUTION No. 1, "Annotated List of the Plants Growing Naturally at the National Arboretum," by Oliver M. Freeman, was published in August 1953.

The CONTRIBUTIONS will be serially numbered. Subject matter will include the results of basic and applied research on cultivated and wild plants, reports on plant explorations and introductions, and compilations and checklists of value to horticulturists.

The continuation of the CONTRIBUTIONS provides a significant opportunity for the further communication of information for the advancement of horticultural and botanical science.

A handwritten signature in dark ink, reading "Henry S. Skinner". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Director
National Arboretum

Acknowledgment

I would like to express gratitude to each person who participated in this survey and to give special thanks to Dr. Theodore R. Dudley and other members of the National Arboretum staff whose advice and encouragement have been most beneficial.

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History, Progeny, and Locations of Crabapples of Documented Authentic Origin

By Roland M. Jefferson, botanist,
Crops Research Division, Agricultural Research Service

Introduction

This publication has two objectives. The first is to supply locations of living crabapple material of documented authentic origin to persons interested scientifically or aesthetically in such plants. The second is to furnish concise historical data pertaining to this material. Data concerning 181 crabapple introductions are included.

Regarding the first objective, there is little doubt among those familiar with crabapple plants that, for various reasons, many are misnamed. John C. Wister, Director, Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pa., was aware of this problem when he wrote (63):¹ "A. F. den Boer who is growing the largest collection [crabapple] in America at Des Moines, reports that from his own experience at least 75% of all plants sold by nurseries are not true to name. This mix-up is partly due to ordinary mistakes in labeling, both on the part of arboretums supplying new species to nurseries and on sales by nurseries."

To further explain misnamed plants, Donald Wyman, Horticulturist, Arnold Arboretum, Jamaica Plain, Mass., wrote (67): "Crab apples hybridize very freely, and because of this, much controversy has resulted in their proper identification. Seed has been gathered in large collections, been grown and the seedlings named after the trees from which the seed was collected. All too frequently such seed has produced plants with totally different characteristics from the parent plant, and when this has become evident, it has caused much confusion."

¹ Italic numbers in parentheses refer to "Selected References," p. 83.

Although plants that obviously are not true to name can be readily eliminated from collections and research consideration, misnamed plants that closely resemble correctly named plants can cause problems. Differences in disease susceptibilities, hardiness reactions, and genetic variations can result in misleading research conclusions.

Because of the effects of misnamed crabapple plants, in 1965 I attempted to locate those crabapple species, varieties, and cultivars most likely to be correctly labeled. I believed this project could be best carried out by seeking original type plants or, in the case of named cultivars, the parent plants or direct asexual propagations from these plants. These plants had to be sought through some of the larger botanic gardens, arboretums, parks, and related institutions that kept accessioning records. To accomplish this, in August 1965, letters (Appendix 1) accompanied by questionnaires (Appendix 2) were sent to many of the previously mentioned types of institutions in the United States and Canada. After the questionnaires were returned and the information was recorded, a confirmation list (Appendix 3) was sent to each participant to insure that the questionnaires were understood.

The questionnaires, all confirmation copies, and additional letters resulting from this project are on file at the National Arboretum.

This report contains the results of the National Arboretum 1965 crabapple survey and is divided into two parts. Part I is a compilation of all the crabapple taxa recorded in this survey, with locations for documented material of authentic origin. All pertinent historical data available to me relating to these plants have been included. Sources for original published descriptions and illustrations are listed for most species and varieties and some cultivars. The descriptions for the remaining cultivars are from nursery catalogs or Arie F. den Boer's notes on species and varieties of flowering and economic crabapples.² Descriptions are presented in general terms since technical descriptions of the plants are beyond the scope of this endeavor.

Part II contains diagrammatic genealogical schemes relating to the progeny of the crabapples of authentic origin cited in Part I.

For convenience and clarity in this report, I am including a key to the location of reported documented crabapple material of authentic origin and a key to originators or introducers of cultivar progeny.

² Unpublished data.

Explanations

All botanical names used follow the rules and recommendations of the "International Code of Botanical Nomenclature 1966"; all cultivar names follow those of the "International Code of Nomenclature for Cultivated Plants 1961." Both codes are published by the International Bureau for Plant Taxonomy and Nomenclature of the International Association for Plant Taxonomy, Utrecht, Netherlands.

Abbreviations and titles of publications listed in the discussions are those most easily recognized by taxonomists and other persons who will use the data in this report. These are as follows:

- Acta Hort. Petrop.—Acta Hortus Petropolitanus
- Am. Midland Nat.—The American Midland Naturalist
- Arbres & Arbustes—Traite des Arbres et Arbustes Qui Se Cultivent en France en Pleine Terre
- Bot. Mag.—Curtis's Botanical Magazine
- Bot. Mag. Tokyo.—The Botanical Magazine Tokyo
- Bull. Acad. Sci. St. Pétersb.—Bulletin de l'Academie Imperial des Sciences de St. Pétersbourg
- Bull. Pop. Inform., Arnold Arb.—Bulletin of Popular Information, Arnold Arboretum
- Bull. Pop. Inform., Morton Arb.—Bulletin of Popular Information, Morton Arboretum
- Dendrol.—Deutsche Dendrologie
- Fedde. Repert.—Feddes Repertorium
- Gard. Chron.—The Gardeners Chronicle
- Handb. Laubh.—Handbuch der Laubholzkunde (in 3 parts 1889-93)
- Ic. Pl. Sinicarum—Icones Plantarum Sinicarum
- Ill. Handb. Laubh.—Illustriertes Handbuch der Laubholzkunde (3 vols. 1906-12)
- Jour. Arnold Arb.—Journal of the Arnold Arboretum
- Mant. Pl.—Mantissa Plantarum
- Mél. Biol.—Mélanges Biologiques Tires du Bulletin: Académie des Sciences de St. Pétersbourg
- Möller's Deutsche Gartn.-Zeit.—Möller's Deutsche Garten-Zeitung
- Nuov. Gior. Bot. Ital.—Nuovo Giornale Botanico Italiano
- Pl. Delavay.—Plantae Delavayanae
- Pl. Wilson.—Plantae Wilsonianae
- Theor.-Prakt. Handb. Forstbot.—Theoretisch-Praktisches Handbuch der Forstbotanik

Some common abbreviations in the discussions are:

- Hab.—Habit
- Fl.—Flower
- Syn.—Synonym
- Introd.—Introduced into cultivation
- Pl.—Plate

Crabapple.—In this report, a crabapple is considered any tree or shrub of the genus *Malus* having fruit approximately 5.2 cm.

or less in diameter. Both ornamental and economic plants are included.

Asterisk (*).—An asterisk following a name of specific, varietal, or cultivar rank indicates the plant did not result from a controlled pollination and the parentage is, therefore, doubtful. In each case where an asterisk does not appear following a name, it should not be assumed, unless otherwise stated, that the plant resulted from a controlled cross but that such evidence is lacking.

Disease free (41).—This refers to the results of an 8-year disease survey conducted by Lester P. Nichols, Pennsylvania State University, University Park. During this period, Nichols rated hundreds of crabapples for the following diseases: scab caused by *Venturia inaequalis* (CKE.) Wint.; cedar apple rust caused by *Gymnosporangium juniperi-virginianae* Schw.; powdery mildew caused by *Podosphaera leucotricha* (Ell. & Ev.) Salm.; and fire blight caused by *Erwinia amylovora* (Burr.) Winslow. Those crabapples Nichols found to be completely free of the above diseases are noted.

Key to Locations of Reported Documented Crabapple Material of Authentic Origin

- (A) Alfred L. Boerner Botanical Gardens, 5879 South 92d Street, Hales Corner, Wisconsin 53130, U.S.A.
- (B) Arie den Boer Arboretum, Des Moines Water Works, 1003 Locust Street, Des Moines, Iowa 50309, U.S.A.
- (C) Arnold Arboretum, Jamaica Plain, Massachusetts 02130, U.S.A.
- (D) Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pennsylvania 19081, U.S.A.
- (E) Beal-Garfield Botanic Garden, Building A-1, South Campus, Michigan State University, East Lansing, Michigan 48823, U.S.A.
- (F) Brooklyn Botanic Garden and Arboretum, 1000 Washington Avenue, Brooklyn, New York 11225, U.S.A.
- (G) Callaway Gardens, Pine Mountain, Georgia 31822, U.S.A.
- (H) Dominion Arboretum and Botanic Garden, Central Experiment Station, Ottawa, Canada.
- (I) Experimental Farm, Canada Department of Agriculture, Morden, Manitoba, Canada.
- (J) Highland and Durand-Eastman Parks, 5 Castle Park, Rochester, New York 14620, U.S.A.
- (K) New York State Agricultural Experiment Station, Geneva, New York 14456, U.S.A.
- (L) Oregon State University, Corvallis, Oregon 97331, U.S.A.
- (M) Royal Botanical Gardens, Hamilton, Ontario, Canada.
- (N) The Holden Arboretum, Sperry Road, Mentor, Ohio 44060, U.S.A.
- (O) The Morton Arboretum, Lisle, Illinois 60532, U.S.A.
- (P) U.S. National Arboretum, Washington, D.C. 20002, U.S.A.
- (Q) U.S. Plant Introduction Station, Glenn Dale, Maryland 20769, U.S.A.

- (R) University of Minnesota Landscape Arboretum, University of Minnesota, St. Paul, Minnesota 55101, U.S.A.
 (S) University of Washington Arboretum, Seattle, Washington 98105, U.S.A.
 (T) University of Wisconsin Arboretum, Birge Hall, University of Wisconsin, Madison, Wisconsin 53706, U.S.A.

Key to Originators or Introducers of Cultivar Progeny

Aldenham	Aldenham House Gardens, Elstree, Hertfordshire, England.
Arrowwood	Arrowwood, James, Navis Trail Breeding Station, Park Rapids, Minnesota, U.S.A.
Baird	Baird, W. P., United States Northern Great Plains Field Station, Mandan, North Dakota, U.S.A.
Bergeson	Bergeson Nursery, Fertile, Minnesota, U.S.A.
Boughen	Boughen Nursery, Valley River, Manitoba, Canada.
Brand	Brand Peony Farm, Faribault, Minnesota, U.S.A.
C.D.A., Alberta	Canada Department of Agriculture, Beaverlodge, Alberta, Canada.
C.D.A., Morden	Canada Department of Agriculture, Morden, Manitoba, Canada.
C.D.A., Ottawa ..	Canada Department of Agriculture, Ottawa, Ontario, Canada.
C.D.A., Rosthern	Canada Department of Agriculture Experiment Station, Rosthern, Saskatchewan, Canada.
den Boer	Des Moines Water Works, Des Moines, Iowa, U.S.A.
Doorenbos	Doorenbos, S. G. A., Department of Parks, The Hague, Holland.
Dunbar	Dunbar, John, Parks System, Rochester, New York, U.S.A.
Gideon	Gideon, Peter M., Excelsior, Minnesota, U.S.A.
Hampton	Hampton, William C., Hardin County, Ohio, U.S.A.
Hansen, C. A.	Hansen, Carl A., Hansen Nurseries, Brookings, South Dakota, U.S.A.
Hansen, N. E.	Hansen, Niels E., Agricultural Experiment Station, Brookings, South Dakota, U.S.A.
Jennings	Jennings Nursery, Shipston-on-Stour, S. Warwick, England.
Kerr	Kerr, W. L., Sutherland, Saskatchewan, Canada.
Knight	Knight, Thomas A., Elton, Hertfordshire, England.
Kornik	Kornik Arboretum, Kornik, Poland.
N.Y. Expt. Sta.	New York State Agricultural Experiment Station, Geneva, New York, U.S.A.
Nairn	Nairn, Robert, Nairn's Nurseries Ltd., Christchurch, New Zealand.
Oakes	Oakes, William, Glenelm Nursery, Miami, Manitoba, Canada.
P.H.S., Brooks	Provincial Horticultural Station, Brooks, Alberta, Canada.
Paul	Paul & Son, Cheshunt, England.

Peffer	Peffer, George P., Pewaukee, Wisconsin, U.S.A.
Porter	Porter, A. J., Parkside, Saskatchewan, Canada.
Reed	Reed, George M., Brooklyn Botanic Garden, Brooklyn, New York, U.S.A.
Salamandyck	Salamandyck, William, Red Deer, Alberta, Canada.
Sax	Sax, Karl, formerly of Bussey Institute and Arnold Arboretum, Jamaica Plain, Massachusetts, U.S.A.
Simpson	Simpson Orchard Co., Inc., Vincennes, Indiana, U.S.A.
Slavin	Slavin, B. H., Parks System, Rochester, New York, U.S.A.
Späth	Späth, Ludwig, Nurseries, Berlin, Germany.
Swarthmore	Swarthmore College, Swarthmore, Pennsylvania, U.S.A.
Tanner	Tanner, J. A., Palo, Iowa, U.S.A.
Univ. of Minn.	University of Minnesota, St. Paul, Minnesota, U.S.A.
Veitch	Veitch, James, & Sons, Ltd., Chelsea, England.
Waterer	Waterer, John, & Sons, Bagshot, Surrey, England.
Welch	Welch, E. S., Mount Arbor Nurseries, Shenandoah, Iowa, U.S.A.
Wellington	Wellington, Richard, Geneva, New York, U.S.A.
Whitney	Whitney, A. E., Franklin Grove, Illinois, U.S.A.
Will	Will, Oscar H., & Co., Bismarck, North Dakota, U.S.A.
Wodarz	Wodarz, R. L., Wyndmere, North Dakota, U.S.A.
Wright, H. R.	Wright, Hayward R., Auckland, New Zealand.
Wright, P. H.	Wright, Percy H., Moose Range, Saskatchewan, Canada.
Wyman	Wyman, Donald, Arnold Arboretum, Jamaica Plain, Massachusetts, U.S.A.
Yeager	Yeager, A. F., Agricultural Experiment Station, Fargo, North Dakota, U.S.A.

Notes Concerning Some Selected Crabapple Cultivars

Alexis*—*Malus* cultivars Alexis*, Amur*, and Dolgo* were grown from open-pollinated seed of *Pyrus baccata cerasifera* collected from the Imperial Botanical Gardens, St. Petersburg (now Leningrad), Russia in 1897. *Pyrus baccata cerasifera* has since been changed to *M. X robusta*.*

Amur*—See Alexis*.

Dolgo*—See Alexis*.

Fairy*—Originated as a chance seedling before 1875 in Jennings Nursery at Shipston-on-Stour, S. Warwick, England.

Fluke No. 10—A wild native crabapple selection made by N. K. Fluke of Davenport, Iowa.

Fluke No. 29—A wild native crabapple selection made by N. K. Fluke of Davenport, Iowa.

John Downie*—Parentage unknown, raised about 1875 by Edward Holmes of Whittington Nursery, Lichfield, E. Stafford, England.

Rosybloom*—A name applied to a group of *M. pumila* var. *niedzwetzkyana* hybrids originating in Canada.

Notes Concerning Some Selected Apple Cultivars

- Alexander—Parentage unknown, introd. into England from Russia in 1817, date of American introduction unknown.
- Angus—Origin of cultivar and name unknown to author.
- Antonovka—An apple of Russian origin.
- Bailey Sweet—A cultivar of unknown origin occurring before 1849.
- Baldwin—A chance seedling, originated about 1740 on the farm of John Ball, Wilmington, Mass.
- Blushed Calville—Russian origin, parentage unknown to author.
- Broad Green—Origin of cultivar unknown to author.
- Delicious—Discovered in 1881 by Jesse Hiatt of Peru, Iowa, and introd. in 1895 by Stark Bros., Louisiana, Mo.
- Fall Greening—Originated at Claverack, Columbia County, N. Y., before 1869.
- Grimes Golden—Originated in West Virginia before 1804.
- Haas—A seedling of unknown parentage. Originated on the farm of Gabriel Cerre, St. Louis, Mo., about 1870.
- Hamilton Morning Star—Origin of cultivar unknown to author.
- Haralson—Originated at Univ. of Minnesota Fruit Breeding Farm, Excelsior. Introd. 1923.
- Jonathan—Originated about 1800 on farm of Philip Rick, Ulster County, New York. Named in honor of Jonathan Hasbrouck, one of its discoverers.
- Kentucky Mammouth—A cultivar of unknown parentage received about 1873 by A. B. Mathews, Knoxville, Ky., from Charles Downing.
- McIntosh—Originated as a chance seedling, before 1870, on the property of Allan McIntosh, Matilda Township, Dundas County, Ontario, Canada.
- McMahon—Originated about 1860 in Richland County, Wis. Possibly a seedling of *M. cv. Alexander* (apple).
- Malinda—A very hardy apple cultivar with medium-size fruit, which originated in Orange County, Vt., before 1860.
- Mercer*—Possibly a hybrid of *M. ioensis* originating in Mercer County, Ill., and introd. by N. K. Fluke of Davenport, Iowa, before 1898.
- Northern Spy—Raised from seed planted in East Bloomfield, N.Y., about 1800, by Heman Chapin.
- Northwestern Greening—Originated in Waupaca County, Wisconsin, before 1895.
- Oldenburg—A Russian apple imported from England in 1835.
- Osimoe—A Russian variety. Said to be a synonym of the apple *M. cv. Hiberna* (2, v. 2).
- Red Astrachan—Of Russian origin. Introd. into N. America about 1835. (Simbirsk No. 9)—Origin of cultivar and name unknown to author.
- Sweet Russet—A name that has been applied to several cultivars and is, therefore, of questionable value.
- Tetofsky—A Russian variety imported in 1835 by the Massachusetts Horticultural Society.
- Wealthy—Grown around 1860 by Peter M. Gideon, Excelsior, Minn., from *M. X robusta** seed.
- Winesap—Origin of cultivar unknown to author.
- Wolf River—Originated on the farm of W. A. Springer, Wolf River, Wis., before 1875.

Yellow Transparent—Parentage unknown, imported from Russia by U.S. Dept. of Agr. in 1870.

Part I: Crabapple Taxa Recorded in Survey

Section A: Species, varieties, and related cultivars

*M. X arnoldiana** ³ (Rehd.) Rehd.

M. baccata X *M. floribunda*. Rehder in Möller's Deutsche Gartn.-Zeit. 24: 27, 2 fig. (1909) as *M. floribunda* var. *arnoldiana*. Rehder in Jour. Arnold Arb. 2: 57 (1920) as *M. X arnoldiana*. Illus: Horticulture (Boston), xxvii, 49 (1918).—Hab.; Bull. Pop. Inform. Morton Arb., v. 8 (1930).—Hab.; ix. 56 (1934).—Fl. Syns: *Pyrus pulcherrima* var. *arnoldiana* (Rehd.) Bailey; *Malus pulcherrima* var. *arnoldiana* (Rehd.) Nash; *Pyrus arnoldiana* (Rehd.) Bean.

Originated as a chance seedling at the Arnold Arboretum about 1883. Introd. by the Arnold Arboretum. Type plant cultivated at the Arnold Arboretum under Accession No. 139-1.

Locations: (C), (D), (J), (N).

Progeny of *Malus X arnoldiana**:

- M. cv. Barbara Ann** (Wyman)
- M. cv. Cardinal** (Wellington)
- M. cv. Dorothea** (Wyman)
- M. cv. Henrietta Crosby* (Sax)
- M. cv. Henry F. DuPont** (Sax)
- M. cv. Linda** (den Boer)
- M. cv. Van Eseltine* (N.Y. Expt. Sta.)

M. baccata (L.) Borkh.

Linnaeus, Mant. Pl. 75 (1767) as *Pyrus baccata*. Borkhausen, Theor.-Prakt. Handb. Forstbot. 2: 1280 (1803) as *Malus baccata*. Illus: Duhamel, Arbres & Arbustes, Ed. 2, vi. pl. 43 (1801-19); Koehne, Dendrol. 222 (1893).—Fl.; Schneider, Ill. Handb. Laubh. 1: 718, 720 (1906). Syns: *Malus rossica* Medicus; *M. sibirica* Borkh.-(Maxim.) Komarov & Klobuk.-Alisova; *M. baccata* var. *leiostyla* Rupr. & Maxim.; *Pyrus baccata* a. *genuina* Regel; *P. microcarpa* Wendl. ex K. Koch; non DC.; *P. baccata* a. *sibirica* Maxim.; *Malus microcarpa baccata* Carr.; *M. baccata* var. *sibirica* Schneid.; *M. pallasiana* Juzepchuk.

Introd. in 1784 by the Royal Botanic Gardens, Kew, Richmond,

³ For a detailed explanation of asterisks used in this publication, see "Asterisk," p. 4.

Surrey, England. Habitat: northeastern Asia to northern China. Material of this species was collected in the wild as seed in the vicinity of Hailar, Manchuria, by H. G. MacMillan and J. L. Stephens, Bureau of Plant Industry, U.S. Dept. of Agr., and received Nov. 23, 1934. U.S.D.A. Plant Introduction No. 107683.

Location: (P).

Progeny of *Malus baccata*:

*M. X arnoldiana** (Rehd.) Rehd.

*M. X hartwigii** Koehne

*M. X micromalus**⁴ Makino

*M. X robusta** Rehd.

CULTIVARS:

cv. Adam* (Boughen)

cv. Alberta (C.D.A., Ottawa)

cv. Albright* (C.D.A., Alberta)

cv. Alexis* (Hansen, N. E.)

cv. Almey (C.D.A., Morden)

cv. Alred* (P.H.S., Brooks)

cv. Altagold* (Salamandyck)

cv. Amsib (Hansen, N. E.)

cv. Amur* (Hansen, N. E.)

cv. Ann Trio (Hansen, N. E.)

cv. Arctic Dawn* (C.D.A., Alberta)

cv. Athabasca (C.D.A., Ottawa)

cv. Babine (C.D.A., Ottawa)

cv. Barbara Ann* (Wyman)

cv. Baskatong (C.D.A., Ottawa)

cv. Beauty* (Hansen, N. E.)

cv. Big River* (Wright, P. H.)

cv. Boom* (Arrowwood)

cv. Brier* (Unknown)

cv. Caputa (Hansen, N. E.)

cv. Cardinal* (Wellington)

cv. Carleton (C.D.A., Ottawa)

cv. Centennial (Univ. of Minn.)

cv. Columbia (C.D.A., Ottawa)

cv. Cranberry (Wodarz)

cv. Crimson Brilliant* (den Boer)

cv. Currant* (Origin unknown)

cv. Dan Trio (Hansen, N. E.)

cv. David Nairn (Wright, H. R.)

cv. Dolgo* (Hansen, N. E.)

cv. Dorothea* (Wyman)

cv. Elsa (C.D.A., Ottawa)

cv. Elsie Burgess (Wright, H. R.)

cv. Erl Trio (Hansen, N. E.)

⁴ Wild plants of this species have been reported in China. See PIENIAZEK, S. A. FRUIT PRODUCTION IN CHINA. XVII Internatl. Hort. Cong. Proc. (1966) 4: 427-452. 1967.

- cv. Fairy* (Jennings)
- cv. Fay Trio (Hansen, N. E.)
- cv. Foxley (Knight)
- cv. Gibb (Peffer)
- cv. Goldfinch* (Swarthmore)
- cv. Goolsbey* (Wodarz)
- cv. Hampton's Siberian* (Hampton)
- cv. Hans Trio (Hansen, N. E.)
- cv. Heart River (Baird)
- cv. Helen* (den Boer)
- cv. Henrietta Crosby (Sax)
- cv. Henry F. DuPont* (Sax)
- cv. Hopa* (Hansen, N. E.)
- cv. Huron (C.D.A. Ottawa)
- cv. Irene* (den Boer)
- cv. Ivan* (Hansen, N. E.)
- cv. Jay Darling* (den Boer)
- cv. Jewell (C.D.A., Ottawa)
- cv. Joan* (Dunbar)
- cv. Joe Trio (Hansen, N. E.)
- cv. Jubilee* (P.H.S., Brooks)
- cv. Katherine* (Slavin)
- cv. Keo* (Hansen, N. E.)
- cv. Kerr (C.D.A., Morden)
- cv. Lady Northcliffe* (Aldenharn)
- cv. Lee Trio (Hansen, N. E.)
- cv. Linda* (den Boer)
- cv. Martha* (Gideon)
- cv. Martha-Dolgo (C.D.A., Morden)
- cv. McPrince (Hansen, N. E.)
- cv. Mecca (C.D.A., Ottawa)
- cv. Mecca-Dolgo (C.D.A., Ottawa?)
- cv. Midnight* (Wright, P. H.)
- cv. Milo* (Hansen, N. E.)
- cv. Mount Arbor Special* (Welch)
- cv. Muskoka (C.D.A., Ottawa)
- cv. Namew (C.D.A., Ottawa)
- cv. Nipissing (C.D.A., Ottawa)
- cv. Northland (Univ. of Minn.)
- cv. Olga (Hansen, N. E.)
- cv. Osman (C.D.A., Ottawa)
- cv. Patricia* (den Boer)
- cv. Paul Imperial* (Paul)
- cv. Pink Beauty (Simpson)
- cv. Pink Giant* (Hansen, C.)
- cv. Prince (C.D.A., Ottawa)
- cv. Printosh (C.D.A., Ottawa)
- cv. Purple Wave* (den Boer)
- cv. Radiant* (Univ. of Minn.)
- cv. Red River (Yeager)
- cv. Red Silver (Hansen, C.)
- cv. Red Splendor* (Bergusson)

- cv. Redflesh Winter (Hansen, N. E.)
- cv. Redheart* (Porter)
- cv. Robert Nairn (Wright, H. R.)
- cv. Robin (C.D.A., Ottawa)
- cv. Robusta (No. 5)* (C.D.A., Ottawa)
- cv. Rosilda (C.D.A., Ottawa)
- cv. Royalty* (Kerr)
- cv. Rudolph* (Skinner)
- cv. Sapina (Hansen, N. E.)
- cv. Saskia* (C.D.A., Rosthern)
- cv. Selkirk (C.D.A., Morden)
- cv. September* (Gideon)
- cv. Silvia (C.D.A., Ottawa)
- cv. Simcoe (C.D.A., Ottawa)
- cv. Sissipuk (C.D.A., Ottawa)
- cv. Snowcap* (C.D.A., Alberta)
- cv. South Dakota Ben (Hansen, N. E.)
- cv. South Dakota Bison (Hansen, N. E.)
- cv. South Dakota Bona (Hansen, N. E.)
- cv. South Dakota Eda (Hansen, N. E.)
- cv. South Dakota Jonsib (Hansen, N. E.)
- cv. South Dakota Macata (Hansen, N. E.)
- cv. Spring Snow* (Porter)
- cv. Sundog (C.D.A., Morden)
- cv. Tanner* (Tanner)
- cv. Timiskaming (C.D.A., Ottawa)
- cv. Toba (C.D.A., Morden)
- cv. Tolsteme* (Hansen, N. E.)
- cv. Toshprince (C.D.A., Ottawa)
- cv. University* (Brand)
- cv. Van Eseltine (N.Y. Exp. Sta.)
- cv. Vanguard* (Univ. of Minn.)
- cv. Wabiskaw (C.D.A., Ottawa)
- cv. White Fox River* (Wright, P. H.)
- cv. Whitney* (Whitney)
- cv. Yellow Siberian* (Hansen, N. E.)
- cv. Zaza (Hansen, N. E.)
- cv. Zelma (Hansen, N. E.)
- cv. Zita (Hansen, N. E.)

M. baccata* cv. *Columnaris

Rehder in Jour. Arnold Arb. 21: 276 (1940) as *M. baccata* f. *columnaris*.

Received in 1927 by the Arnold Arboretum from the Royal Botanic Gardens, Kew, Richmond, Surrey, England, as grafts of *M. orthocarpa*. Named in 1940 and introd. by the Arnold Arboretum. Type plant was Arnold Arboretum No. 220-32. Now at the Arnold Arboretum under No. 135-42 (grafts from No. 220-32).

Description: Flowers; open pure white, approx. 4.1 cm. across,

buds creamy white. Fruit; yellow with red cheek, approx. 1.3 cm. in diam.

Locations: (B), (C).

M. baccata* cv. *Gracilis

Rehder in Jour. Arnold Arb. 2: 49 (1920) as *M. baccata* f. *gracilis*.

Received as plant in 1913 from James Veitch & Sons, Ltd., Chelsea, England, who grew plant from seed #329 collected in 1910 by William Purdom in northern China. Introd. by the Arnold Arboretum. Original plant Arnold Arboretum No. 10093 (dead).

Description: Flowers; open white, approx. 4.3 cm. across, buds rose pink. Fruit; dark red or brownish red, approx. 8.0 mm. in diam.

Locations: (A), (B), (C), (J), (L), (O).

***M. baccata* var. *himalaica* (Maxim.) Schneid.**

Maximowicz in Bull. Acad. Sci. St. Pétersb. 19: 170 (Diagn. Pl. Nov. Jap. Mandsh. Dec. 15) (in Mél. Biol. 9: 167) (1873) as *Pyrus baccata* v. *himalaica*. Schneider, Ill. Handb. Laubh. 1: 721 (1906), exclud. pl. chin. et fig. as *M. baccata* var. *himalaica*.

Introd. 1919(?). Habitat: western Himalayas; southwestern China. Material of known wild origin grown from seed collected in Yetsi Valley, north of Kulu, in Muli territory, Szechwan, China, by J. F. Rock, Agr. explorer for the Univ. of Calif. Bot. Gard. Expedition, and presented through T. H. Goodspeed, Dept. of Bot., Univ. of Calif., Berkeley, Calif. Received June 27, 1933. Assigned U.S.D.A. Plant Introduction No. 103288. Disease free (41).

Location: (P).

M. baccata* cv. *Jackii

Rehder in Sargent, Pl. Wilson. 2: 291 (1915) as *Malus baccata* f. *jackii*.

Introd. by the Arnold Arboretum. Grown from scions sent from Seoul, Korea, in 1905, by J. G. Jack of the Arnold Arboretum. Type plant, now dead, was Arnold Arboretum No. 7348. Grafts from type plant growing at Arnold Arboretum under No. 84-45. Disease free (41).

Description: Flowers; single, expanding buds white with touch of pink, open pure white, approx. 4 cm. across. Fruit; purplish or maroon red, tan on shaded side, approx. 1.2 cm. in diam.

Locations: (B), (C), (J).

***M. bracteata* Rehd.**

Rehder in Sargent's, Trees and Shrubs, v. 2, p. 230 (1913). Illus: Sargent, Manual of the Trees of North America, Ed. 2, p. 387, fig. 344 (1926). Syn: *Pyrus bracteata* (Rehd.) Bailey.

Introd. by the Arnold Arboretum. Habitat: Missouri to Georgia and Alabama. Grown from seed sent in 1912 to the Arnold Arboretum by B. F. Bush and C. P. Sargent, from Campbell, Mo. Type plant (Bush No. 6631) at Arnold Arboretum under No. 11237.

Location: (C).

***M. coronaria* (L.) Mill. cv. Charlottae**

Rehder in Jour. Arnold Arb. 2: 52 (1920) as *M. coronaria* f. *charlottae*. Syns: *M. cv. Charlotte*; *M. coronaria cv. Charlotte*; *M. coronaria cv. Charlotte Wolfi*; *M. coronaria var. dasycalyx cv. Charlottae*.

Discovered near Waukegan, Ill., in 1902, by E. deWolf, husband of Charlotte M. deWolf, and named in her honor. Introd. by the Arnold Arboretum. Type plant Arnold Arboretum No. 10794 now at Arnold Arboretum grown from scions received in 1920 from Mr. deWolf.

Description: Flowers; double (12–18 petals), expanding buds flesh pink, open pale pink, approx. 4.8 cm. across. Fruit; light petals, approx. 4 cm. across. Fruit; dark green, approx. 3 cm. in

Location: (C).

***M. coronaria* cv. Elk River**

A selection of *Malus coronaria* discovered by A. W. Keays growing near Elk River, Minn., about 40 miles north of Minneapolis, Minn.

Introd. in 1930 by Niels E. Hansen, S. Dak. Agricultural Experiment Station, Brookings, S. Dak.

Description: Flowers; single, expanding buds pink to rose red with carmine veins, open pink flushed with rose pink on back of petals, approx. 4 cm. across. Fruit; dark green, approx. 3 cm. in diam.

Location: (B).

Progeny of *M. coronaria* cv. Elk River:

M. cv. Chinook (Hansen, N. E.)

M. cv. Cranberry (Wodarz)

M. cv. Kola (Hansen, N. E.)

*M. cv. Red Tip** (Hansen, N. E.)

M. cv. Redflesh (Hansen, N. E.)

M. cv. Redflesh Winter (Hansen, N. E.)

M. cv. Shoko (Hansen, N. E.)

M. cv. Tipi (Hansen, N. E.)

M. cv. Wamdesa (Hansen, N. E.)

M. coronaria cv. Nieuwlandiana

A. D. Slavin in *Am. Midland Nat.* 12:364 (1931) as *M. coronaria f. nieuwendiana*. Syn: *M. cv. Nieuwland*.

Introd. by the Parks System, Rochester, N.Y. Selected by Bernard H. Slavin from a group of *M. coronaria* seedlings raised for planting in Rochester, N.Y., parks. Named in 1931 by Arthur D. Slavin, son of B. H. Slavin, for the Rev. J. A. Nieuwland, Professor of Botany at the Univ. of Notre Dame.

Description: Flowers; double, expanding buds rose red, open pink, approx. 5.5 cm. across. Fruit; yellowish green, approx. 4 cm. in diam.

Locations: (C), (D), (J), (S).

M. coronaria cv. Thoms

An employee of Siebenthaler Nursery, Louis Thoms, discovered this spontaneous selection in 1920 on his farm near Franklin, Ohio. Named for Thoms and introd. in 1927 by Siebenthaler Nursery, Dayton, Ohio. Syns: *M. cv. Thoms*; *M. cv. Thomsii*; *M. coronaria plena*; *M. coronaria thomsi*. This type also occurs spontaneously in Pennsylvania according to Wister (64).

Description: Flowers; single, pink, approx. 4 cm. across. Fruit; greenish yellow, approx. 2.5 cm. in diam.

Location: (D).

M. X dawsoniana* Rehd.

Rehder in Sargent's, *Trees and Shrubs*, v. 2, p. 23 (1907).

M. fusca X *M. pumila*.

Introd. by the Arnold Arboretum. Grown from open-pollinated seed collected in Oregon by Cyrus G. Pringle and sent in 1881 to the Arnold Arboretum. Named for Jackson Dawson, former propagator for the Arnold Arboretum. Type plant (now dead) was Arnold Arboretum No. 5407. Grafts from type plant now growing at the Arnold Arboretum under No. 5407-2.

Locations: (C), (J), (O).

M. glabrata Rehd.

Rehder in Sargent's, *Trees and Shrubs*, v. 2, p. 225 (1913). Illus: Coker & Totten, *Trees Southeast, States*, 195 (1934). Syn: *Pyrus glabrata* (Rehd.) Bailey.

Introd. by the Arnold Arboretum. Habitat: North Carolina to Alabama. Grown from seed collected in the wild by Charles S.

Sargent in 1912 and first recorded as Sargent's *Malus* seedling No. 7.

Location: (C).

M. X gloriosa* Lemoine

Lemoine, Cat. No. 205: 14 (1931).—Rehder, Manual of Cultivated Trees and Shrubs, Ed. 2, 394 pp. (1940).

	<i>M. pumila</i> var. <i>niedzwetzkyana</i>] = <i>M. X gloriosa</i> *
<i>M. floribunda</i>] <i>M. X scheideckeri</i> *	
<i>M. prunifolia</i>		

Originated at V. Lemoine & Fils, Nancy, France, before 1931. Introd. into U.S.A. by the Arnold Arboretum in 1936.

Locations: (B), (C).

***M. halliana* var. *spontanea* (Mak.) Koidz.**

Makino in Bot. Mag. Tokyo 24: 67 (1910) as *Malus floribunda* var. *spontanea*. Illus: Asami, the Crab-apples and Nectarines of Japan 28, fig. 17–19, pl. 4, 40d (1927); Arnoldia, v. 9, No. 3, p. 10, pl. III (April 1949). Syn: *Malus spontanea* (Mak.) Mak.

Introd. into U.S.A. by the Arnold Arboretum in 1919 from a plant collected by E. H. Wilson in Japan. Habitat: Kyushu Mountains, Japan.

Locations: (B), (C), (D), (O).

***M. honanensis* Rehd.**

Rehder in Jour. Arnold Arb. 2: 51 (1920). Syn: *Sinomalus honanensis* (Rehd.) Koid.

Introd. into U.S.A. by the Arnold Arboretum from seed #1691 sent to Arnold Arboretum in 1921 from China by J. Hers, a professional plant collector from France. Habitat: northeastern China.

Location: (N).

***M. hupehensis* (Pamp.) Rehd.**

Pampanini in Nuov. Gior. Bot. Ital. (n. s.) 17: 291 (1910) as *Pyrus hupehensis*. Rehder in Jour. Arnold Arb. 14: 206 (1933). Illus: Sealy in Bot. Mag. 164: pl. 9667, fig. [p. 3] 1946. Illus. as *M. theifera* Rehd.; Chun, Chinese Econ. Trees, p. 174 (1921); Hu & Chun, Ic. Pl. Sinicarum, pl. 32 (1927); Bull. Pop. Inform. Arnold Arb., Ser. III, i. 19 (1927).—Hab. Syns: *Malus theifera* Rehd.; *Pyrus theifera* (Rehd.) Bailey.

Introd. into U.S.A. by the Arnold Arboretum. Collected as seed in 1908 in Ichang, west Hupeh, China, by E. H. Wilson of the Arnold Arboretum.

Locations: (A), (B), (C), (D), (J), (S).

***M. ioensis* (Wood) Britt. cv. Boone Park**

A clone of *M. ioensis* discovered by Arie F. den Boer and Clyde Heard in 1940 growing in Boone Park, Boone, Iowa.

Introd. by Arie F. den Boer and Clyde Heard of Des Moines, Iowa.

Description: Flowers; single, expanding buds rose red to deep rose pink, open light rose pink, back of petals and veins darker pink, approx. 4 cm. across. Fruit; dull green to dull yellowish green, approx. 3 cm. in diam.

Locations: (A), (B), (D).

***M. ioensis* cv. Fimbriata**

A. D. Slavin in Am. Midland Nat. 12: 363 (1931) as *M. ioensis* f. *fimbriata*.

Introd. by the Parks System, Rochester, N.Y. A seedling selected by Bernard H. Slavin, Superintendent of the Parks System, Rochester, N.Y. Named in 1931 by his son Arthur D. Slavin. Name refers to the finely fringed edges of the petals.

Description: Flowers; expanding buds brownish red to red, open shell pink, approx. 5 cm. across. This cultivar seldom, if ever, produces fruit.

Locations: (E), (J).

***M. ioensis* cv. Fiore's Improved**

A seedling selection from a group of *M. ioensis* seedlings growing in a seedbed at Charles Fiore Nurseries, Inc., Prairie View, Ill.

Introd. by Charles Fiore Nurseries before 1964.

Description: Flowers; twice the size of *M. ioensis* flowers, occasionally semidouble with color similar to *M. ioensis* cv. Plena. Fruit; 1/3 larger than those of *M. ioensis*. Bark; very smooth, light gray over the entire plant.

Location: (E).

***M. ioensis* cv. Nevis**

Discovered in 1930 by James Arrowwood near Nevis, Minn.

Introd. by Niels E. Hansen, South Dakota Agricultural Experiment Station, Brookings, S. Dak. This cultivar, which is considered a seedling of *M. ioensis* (67), is a dwarf that bears when only 4 ft. tall.

Description: Flowers; single, pink, approx. 4 cm. across. Fruit; green, approx. 3 cm. in diam.

Locations: (B), (Q).

Progeny of *M. ioensis* cv. Nevis:

M. cv. Wakonda (Hansen, N. E.)

M. cv. Wecota (Hansen, N. E.)

M. cv. Wetonka (Hansen, N. E.)

M. cv. Wiyuta (Hansen, N. E.)

M. cv. Wotanda (Hansen, N. E.)

***M. ioensis* cv. Nova**

Received by The Morton Arboretum, Lisle, Ill., in 1928 from Augustine Nursery, Normal, Ill., as *M. ioensis* cv. Flore Plena Nova. Name was subsequently changed to *M. ioensis* cv. Nova. This introduction is considered by Arie den Boer (22) to be a sport of *M. ioensis* cv. Plena, differing only in a deeper pink flower color. Syns: *M. ioensis* cv. Flore Plena Nova; *M. ioensis* cv. Plena Nova; *M. cv. Plena Nova*.

Introd. by The Morton Arboretum, Lisle, Ill.

Description: Flowers; double (18–35 petals), open rose pink, approx. 4.5 cm. across, expanding buds pink. Fruit; few, green to greenish yellow, approx. 3.2 cm. in diam.

Location: (D).

***M. ioensis* var. *palmeri* Rehd.**

Rehder in Sargent's, Trees and Shrubs, v. 2, p. 232 (1913). Syn: *Pyrus ioensis* var. *palmeri* (Rehd.) Bailey.

Grown from seed sent to the Arnold Arboretum in 1910 by E. J. Palmer, Webb City, Mo. Named for E. J. Palmer and introd. by the Arnold Arboretum. Habitat: Missouri, Arkansas, and eastern Oklahoma. Differs from species in its smaller, oblong, more thinly pubescent leaves usually rounded at apex.

Locations: (C), (J).

***M. kansuensis* (Batal.) Schneid.**

Batalin in Acta Hort. Petrop. 13:94 (1893) as *Pyrus kansuensis*. Schneider in Fedde. Repert. 3: 178 (1906); and in Ill. Handb. Laubh. 2: 1001 (1912). Syn: *Eriolobus kansuensis* (Batal.) Schneid.

Introd. by the Arnold Arboretum. Sent to Arnold Arboretum in 1911 as seed *Pyrus* No. 4115A collected by E. H. Wilson in Tachien-Lu, west Szechwan, China. Habitat: Kansu, Hupeh, and Szechwan, China. Disease free (41).

Location: (C).

***M. prattii* (Hemsl.) Schneid.**

Hemsley in Kew Bull. 1895: 16 (1895) as *Pyrus pratti*. Schneider, Ill. Handb. Laubh. 1: 719, fig. 397 p-p¹, 398k-m (May 1906). Illus: Lee, Forest Botany of China, 613 (1935). Syn: *Docyniopsis pratti* (Hemsl.) Koid.

Discovered by and named for A. E. Pratt. Grown from seed *Malus* #1107 collected in 1909 by E. H. Wilson in Wa-Shan, west Szechwan, China. Habitat: Szechwan, China. Introd. into U.S.A. by the Arnold Arboretum.

Location: (O).

M. X purpurea* (Barbier) Rehd. cv. Aldenhamensis

Gibbs in Gard. Chron., Ser. 3, 72: 110 (1922), without description as *Pyrus malus aldenhamensis*; Rehder in Jour. Arnold Arb. 7: 27 (1926, March) as *Malus purpurea* var. *aldenhamensis*; Rehder, Bibliography of Cultivated Trees and Shrubs, 270a, 1949 as *Malus purpurea* f. *aldenhamensis*. Syns: *Malus floribunda aldenhamensis* Lamproy; *Malus sylvestris* var. *aldenhamensis* Bailey.

<i>M. halliana</i>	}	<i>M. X. atrosanguinea</i> *	}	= <i>M. X purpurea</i> cv. Aldenhamensis*
<i>M. sieboldii</i>				
		<i>M. pumila</i> var. <i>niedzwetzkyana</i>		

Introd. into U.S.A. by the Arnold Arboretum. A chance seedling that appeared, about 1915, at Aldenham House Gardens, Elstree, Hertfordshire, England. Selected by the Honorable Vicary Gibbs. Propagations by Gibbs sent to the Arnold Arboretum in 1917 died. Additional propagations sent to the Arnold Arboretum by Gibbs in 1923 still growing under No. 11785.

Description: Flowers; single and semidouble, expanding buds maroon red, open purplish red fading to deep purplish pink, approx. 4.5 cm. across. Fruit; dark maroon red to maroon purple, shaded side green to bronze, approx. 2 cm. in diam.

Locations: (C), (P).⁵

***M. X purpurea* cv. Kornicensis**

Originated by Kornik Arboretum, Kornik, Poland. Introd. into

⁵Received at the National Arboretum in 1942 as a rooted sucker of the original tree, from the U.S. Dept. of Agr. Plant Introduction Station, Glenn Dale, Md., under U.S.D.A. Plant Introduction No. 52647. Orig. source Hon. Vicary Gibbs, Elstree, Hertfordshire, England.

M. halliana

M. sieboldii — $\left. \begin{array}{l} M. X \text{ atrosanguinea}^* \\ M. \text{ pumila var. niedzwetzkyana} \end{array} \right\} = M. X \text{ purpurea} \\ \text{cv. Kornicensis}$

Locations: (C), (E).

M. halliana

M. sieboldii } *M. X atrosanguinea**
M. pumila var. *niedzwetzkyana* } = *M. X purpurea*
 cv. *Lemoinei**

Locations: (C), (D).⁶

Progeny of *Malus* X *purpurea* cv. Lemoinei*:

M. cv. Liset (Doorenbos)

M. cv. Profusion (Doorenbos)

Grown at the Arnold Arboretum from seed sent in 1904 by C. S. Sargent from Peking, China. Introd. into cultivation by the Arnold Arboretum.

⁶ John C. Wister received scions from V. Lemoine & Fils, Nancy, France, in 1926. Propagations now growing at Swarthmore College, Swarthmore, Pa., were made by Wister in 1931 from his original plants.

⁷ *M. X robusta** = *M. baccata* X *M. prunifolia*.

Description: Flowers; single and semidouble, expanding buds white with trace of pink, open pure white, approx. 4 cm. across. Fruit; yellow and red to dark crimson, approx. 2.3 cm. in diam.

Locations: (B), (C), (O).

M. X robusta**⁸ cv. *Persicifolia

Rehder in Jour. Arnold Arb. 2: 55 (1920) as *M. robusta* var. *persicifolia*.

Grown from seed collected in 1910 by William Purdom in northern China. Received as plant in 1913 by the Arnold Arboretum from James Veitch & Sons, Ltd., Chelsea, England, as *Pyrus* sp. (Purdom No. 179). Introd. into cultivation by the Arnold Arboretum. Cultivar name refers to the narrow peachlike leaves.

Description: Flowers; single, white, approx. 4 cm. across. Fruit; bright red, shaded side sometimes yellowish or brownish green, approx. 2 cm. in diam.

Locations: (C), (J), (O), (Q).

***M. X robusta**⁹ (No. 5)**

Grown from seed obtained in 1927 from Russia through arrangements with the Arnold Arboretum. Introd. in 1947 by the Central Experimental Farm, Canada Dept. of Agri., Ottawa, Ontario, Canada.

Selected for its use as a hardy vigorous understock for grafting apple cultivars. Differs from typical *M. X robusta** by having a more wide spreading habit, slightly larger, bright-red and yellow fruit, and much larger, broad, oval leaves that turn bright yellow in the fall. Although its use has never been exploited as an ornamental, it has value for its attractive fruits and fall leaf color.

Description: Flower and fruit descriptions similar to the species.

Locations: (C), (H), (I), (Q).

***M. sargentii* Rehd.**

Rehder in Sargent's, Trees and Shrubs, v. 1, p. 71, pl. 36 (1903). Illus: Rehder (loc. cit.); S. Richter in Planta (Arch. Wiss. Bot.), viii. 158 (1929).—Fl.; Bull. Pop. Inform. Morton Arb. x. 47 (1935).—Hab. Syns: *Pyrus sargentii* (Rehd.) Bean; *Pyrus malus sargentii* Anon. in Jour. Hort. Soc. [London] 41: cxix, fig. 96 (1915); *Malus sieboldii* var. *toringo* a. *sargentii* Koid.; *Malus sieboldii* var. *sargentii* f. *ascendens* Asami.

⁸See footnote 7.

⁹See footnote 7.

Grown from seed collected in 1892 near Mororan in Hokkaido, Japan, by C. S. Sargent, former director of the Arnold Arboretum. Introduced into cultivation by the Arnold Arboretum.

Locations: (C), (J).

M. sargentii* cv. *Rosea

Selected at the Arnold Arboretum from a group of seedlings numbered 1 B.H.S. received in 1921 from the Parks System, Rochester, N.Y.

Named and introduced by the Arnold Arboretum. Differs from species by having reddish-pink flower buds.

Description: Flowers; expanding buds reddish pink, open white, approx. 3.5 cm. across. Fruit; dark red, approx. 1 cm. in diam.

Locations: (C), (J).

Progeny of *M. sargentii* cv. *Rosea*:

M. cv. Mary Potter (Sax)

***M. sieboldii* (var. *arborescens*) Rehder.**

Rehder in Sargent, Pl. Wilson. 2: 294 (1915). Illus: E. H. Wilson, America's Greatest Garden, 38 (1925).—Hab. Syns: *Pyrus baccata* Thun.; *Crataegus alnifolia* sensu Regel, non Sieb. & Zucc.; *Crataegus cavaleriei* Léveillé & Vaniot; *Pyrus subcrataegifolia* Léveillé; *Photinia rubro-lutea* Léveillé; *Malus toringo* f. *typica* Matsum.; *Crataegus taquetii* Léveillé; *Pyrus esquirolii* Léveillé; *Malus toringo* Nakai; *Malus sieboldii* var. *koringo* b. *vulgaris* Koid. Because the taxonomic characters of *M. sieboldii* var. *arborescens*, defined by Rehder (46), have been documented by Asami (1) as occurring also in the species, this variety is to be regarded as a synonym of *M. sieboldii*.

Introduced into cultivation by the Arnold Arboretum from seed collected from Japan by C. S. Sargent in 1882. Habitat: mountains of Japan and Island of Quelpart, Korea.

Locations: (C), (H), (J).

M. sieboldii* cv. *Fuji

Jefferson in Amer. Hort. Mag. 47: 22–25 (1968). Introduced by the U.S. National Arboretum, U.S. Dept. of Agr., Washington, D.C.

For 26 years, cv. Fuji was an unnamed crabapple in the National Arboretum crabapple collection. It was received in 1942 from the U.S. Plant Introduction Station, Glenn Dale, Md. The parent plant (U.S.D.A. Plant Introduction No. 325156), at Glenn Dale, is approximately 40 years old and stands 28 ft. tall with a spread of 46 ft. Origin of the parent plant is unknown.

Description: Flowers; double (13–15 petals), expanding buds purplish red, open greenish white with occasional traces of purplish red, approx. 3.8 cm. across. Fruit; orange, approx. 1.2 cm. in diam.

Locations: (P), (Q).

***M. sieboldii* var. *zumi* (Matsum.) Asami (42)**

Matsumura in Bot. Mag. Tokyo 12: 1 (1899) as *Pirus* (*malus*) *zumi*. Asami, The Crab-apples and Nectarines of Japan, p. 41, fig. 41–46, 48, pl. 22, 23, 42d-f (1927). Illus: Sargent, Trees and Shrubs, v. 1, pl. 91 (1905) as *M. zumi* (*M. baccata* var. *mandshurica* X *sieboldii*) Rehd.; Schneider, Ill. Handb. Laubh. 1:722, 723 (1906) as *M. zumi* Rehd.; Asami (loc. cit.). Syns: *Malus* X *zumi* Rehd.; *Pyrus toringo* v. *integrifolia* Franchet & Savatier; *Malus toringo* a. *integrifolia* Zabel ex Dippel; *Pirus* (*malus*) *zumi* Matsum.; *Malus baccata* var. *mandshurica* f. *zumi* Matsum.

Introd. into U.S.A. by the Arnold Arboretum from seed collected in 1892 by C. S. Sargent in Japan. Habitat: Island of Honshu, Japan (rare).

Locations: (B), (C), (J).

Progeny of *M. sieboldii* var. *zumi*:

M. cv. Professor Sprenger* (Doorenbos)

M. cv. Winter Gold* (Doorenbos)

M. sieboldii* var. *zumi* cv. *Calocarpa

Illus: Bull. Pop. Inform. Morton Arboretum, x. 44 (1935).—Hab. as *M. zumi* X *calocarpa* Rehd. Syns: *M.* X *zumi* var. *calocarpa* (Rehd.); *Malus sieboldii* var. *calocarpa* Rehd.; *Pyrus sieboldii* var. *calocarpa* Bailey.

Introd. into U.S.A. by the Arnold Arboretum from seed sent from Japan, in 1890, by William S. Bigelow.

Description: Flowers; single, expanding buds deep red, open white to pinkish white, approx. 3.5 cm. across. Fruit; red, lighter on shaded side, approx. 1 cm. in diam.

Locations: (A), (B), (C), (J).

Progeny of *M. sieboldii* var. *zumi* cv. *Calocarpa*:

M. cv. Golden Hornet* (Waterer)

***M.* X *sublobata* (Dipp.) Rehd.**

M. prunifolia X *M. sieboldii*.

Dippel, Handb. Laubh. 3: 400 (1893) as *Malus ringo* a. *sublobata*. Rehder in Jour. Arnold Arb. 2: 56 (1920) as *Malus* X *sublobata*. Illus: N.Y. Agr. Expt. Sta. Tech. Bull. 214, fig. 7.

(1933). Syns: *Pirus ringo sublobata* Zabel; *Malus ringo* X *toringo* (f.) *sublobata* et (f.) *trilobata* Zabel.

Introd. into cultivation by the Arnold Arboretum. According to Rehder (loc. cit.) of unknown origin probably grown from seed brought by C. S. Sargent from Japan in 1892. The name refers to slightly lobed leaves.

Locations: (C), (O).

***M. toringoides* (Rehd.) Hughes**

Rehder in Sargent, Pl. Wilson. 2: 286 (1915) as *Malus transitoria* var. *toringoides*. Hughes in Kew Bull. 1920: 205, fig. Ba-e (1920). Illus: Hughes (loc. cit., p. 207).—Fl.; Stapf in Bot. Mag. cxlviii. t. 8948 (1923). Syns: *Pyrus transitoria* var. *toringoides* Bailey; *Pyrus toringoides* Osborn; *Sinomalus toringoides* Koidzumi.

Introd. in England by James Veitch & Sons, Ltd., Chelsea, in 1904 and U.S.A. by the Arnold Arboretum in 1908, from seed collected by E. H. Wilson in west Szechwan, China. Habitat: western China. Type plant Arnold Arboretum No. 17475 grown from Wilson No. 1285.

Location: (C).

M. toringoides* cv. *Macrocarpa*

Raised from *M. toringoides* seed collected at the Arnold Arboretum by F. C. Stern, Goring-by-the-Sea, Sussex, England. Introd. into U.S.A. by the Arnold Arboretum in 1939 from scions received in 1933 from Stern. Differs from species by having larger fruit and leaves with less deeply cut lobes.

Description: Flowers; single, expanding buds pink or pinkish white, open white, approx. 2.5 cm. across. Fruit; orange yellow and red with bluish bloom, approx. 2.5 cm. in diam.

Locations: (A), (B), (C), (L), (S).

***M. transitoria* (Batal.) Schneid.**

Batalin in Acta Hort. Petrop. 13: 95 (1893) as *Pyrus transitoria*. Schneider, Ill. Handb. Laubh. 1: 726 (1906); and in Fedde. Repert. 3: 178 (1906). Illus: Kew Bull. 1920, p. 207—Fl.; Rehder and Wilson in Jour. Arnold Arb. ix. pl. 12 (1928).—Hab. Syns: *Pyrus malus transitoria* Anon. in Garden 86: 485, fig. (1922); *Sinomalus transitoria* Koid.

Introd. into U.S.A. by the Arnold Arboretum from seed collected in 1911 by William Purdom in Yen-an-fu, Shensi, China. Habitat: northwestern China.

Location: (A).

***M. tschonoskii* (Maxim.) Schneid.**

Maximowicz in Bull. Acad. Sci. St. Pétersb. 19: 169 (in Mém. Biol. 9: 165) (1873) as *Pirus tschonoskii*. Schneider in Fedde Repert. 3: 179 (Dec. 1906). Illus: Jour. Jap. Bot. viii. 140 (1932). Syns: *Eriolobus tschonoskii* Rehd.; *Cormus tschonoskii* (Maxim.) Koid.; *Docyniopsis tschonoskii* Koid.; *Macromeles tschonoskii* (Maxim.) Koid.

Introd. by the Arnold Arboretum from seed collected in 1892 by C. S. Sargent in Nikko, Central Honshu, Japan. Habitat: Honshu, Japan (rare).

Location: (C).

***M. yunnanensis* (Franch.) Schneid.**

Franchet, Pl. Delavay. 228 [1890] as *Pyrus yunnanensis*. Schneider in Fedde Repert. 3: 179 (Dec. 1906). Syns: *Eriolobus yunnanensis* (Franch.) Schneider; *Cormus yunnanensis* (Franch.) Koid., *Docyniopsis yunnanensis* (Franch.) Koid.

Discovered by Pierre Delavay in Yunnan, China. Introd. into U.S.A. by the Arnold Arboretum in 1909 through seed collected by E. H. Wilson in Ching-chi Hsien, China. Habitat: Hupeh, Szechwan, and Yunnan, China. Disease free (41).

Locations: (C), (J).

Section B:

Cultivars¹⁰

cv. Adam*

A seedling, probably of *M. baccata*, discovered in 1930 at Boughen Nurseries, Valley River, Manitoba, Canada, and introd. about 1935.

Description: Flowers; single, expanding buds rose red, open white, approx. 4.2 cm. across.

Locations: (I), (E).

¹⁰ For origin and parentage of some selected cultivars, see "Notes Concerning Some Selected Crabapple Cultivars," p. 6, and "Notes Concerning Some Selected Apple Cultivars," p. 7.

cv. Adams*

Originated as a chance seedling about 1947 at the West Springfield, Mass., residence of the late Walter Adams, former president of Adams Nursery, Inc., Westfield, Mass. Syn: *M. adamsi*. As of 1967, the original tree is still standing. Disease free (41).

Description: Flowers; single, expanding buds red opening to pink, approx. 4 cm. across. Fruit; carmine red, approx. 2 cm. in diam.

Locations: (C), (E), (O).

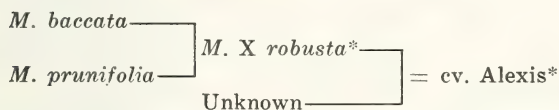
cv. Albright*

An open pollinated seedling of *M. baccata* and an unknown Rosybloom crabapple. Extremely hardy.

Introd. and named in 1964 by Research Station, Research Branch, Canada Dept. of Agr., Beaverlodge, Alberta, Canada.

Description: Flowers; single, expanding buds and open flowers pink, approx. 5 cm. across. Fruit; dark purple with red flesh, approx. 2 cm. in diam. and over 3 cm. long, remaining on tree until removed by birds in February. Disease free (41).

Location: (H).

cv. Alexis*

An open pollinated selection grown from seed collected in 1897 by Niels E. Hansen from the Imperial Botanical Gardens, St. Petersburg (now Leningrad), Russia.

Introd. in 1919 by South Dakota Agricultural Experiment Station, Brookings, S. Dak. Alexis is a Russian male name.

Description: Flowers; single, expanding buds rose pink, open white, approx. 4 cm. across. Fruit; bright red to deep crimson with bluish bloom, approx. 3 cm. in diam.

Locations: (B), (I).

cv. Almey

A second generation (F_2) hybrid of *Malus baccata* X *M. pumila* var. *niedzwetzkyana*. Syn: *M. cv. Sunglory*.

Selected, introd., and named in 1945 by the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Named in honor of J. R. Almey, horticulturist of the Canadian Pacific

Railway Company, Winnipeg, Manitoba, Canada. Formerly Mor-den 452.

Description: Flowers; single, expanding buds deep maroon or purple red, open purple red with claw and base of petals and center vein pale lavender to nearly white, approx. 4.5 cm. across. Fruit; maroon, approx. 2.3 cm. in diam.

Locations: (C), (H), (I), (P), (Q), (R).

cv. Alred*

<i>M. pumila</i> var. <i>niedzwetzkyana</i> —	}	cv. Hopa*	}	= cv. Alred*
<i>M. baccata</i> —				

An open pollinated seedling.

Introd. by the Provincial Horticultural Station, Brooks, Alberta, Canada. First distributed in 1937. Formerly B.F. #4. Distributed for testing by introducer under No. AL-14-B-4. Extremely hardy. Disease free (41).

Locations: (I), (Q).

cv. Amisk*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Amisk Lake in northeastern Saskatchewan, on the Manitoba border.

Description: Flowers; single, expanding buds carmine, open pink, approx. 5 cm. across. Fruit; red and yellow, approx. 3.5 cm. in diam.

Locations: (H), (I), (O), (Q).

cv. Amsib

Malus ioensis X *M. baccata*. The *M. ioensis* used in this cross was a wild red-fruited selection from Iowa, possibly a hybrid. The *M. baccata* was grown from seed brought by N. E. Hansen in 1906 from Moscow, Russia.

Originated and introd. in 1932 by Niels E. Hansen, South Dakota Agricultural Experiment Station, Brookings, S. Dak. The name "Amsib" is a combination of "AM" from America and "SIB" from Siberia, which represents the origin of the parents.

Description: Fruit; green with dull red blush, approx. 3.5 cm. in diam.

Location: (Q).

cv. Anaros*

An open pollinated seedling of *Malus* cv. Antonovka (apple).

Discovered, named, and introd. before 1940, by the Experimental Farm, Canada Dept. of Agr., Rosthern, Saskatchewan, Canada. Formerly Rosthern No. 2.

Description: Fruit: yellow and red, approx. 3.5 cm. in diam. Disease free (41).

Locations: (I), (Q).

cv. Arctic Dawn*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana* and possibly *M. baccata*.

Introd. and named in 1952 by Research Station, Research Branch, Canada Dept. of Agr., Beaverlodge, Alberta, Canada. Received by introducer in 1941 from the Experiment Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Extremely hardy.

Description: Flowers; single, expanding buds pink, open white and pink, approx. 2 cm. across. Fruit; purplish red, approx. 1.2 cm. in diam., persisting into winter.

Locations: (H), (I), (Q).

cv. Arrow*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*, occurring in 1920.

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Arrow Lake in southern British Columbia.

Description: Flowers; single, expanding buds deep purplish red, open purplish pink, approx. 4 cm. across. Fruit; dull purplish red with heavy bluish bloom, approx. 2.5 cm. in diam.

Locations: (B), (C), (H), (I), (M), (O).

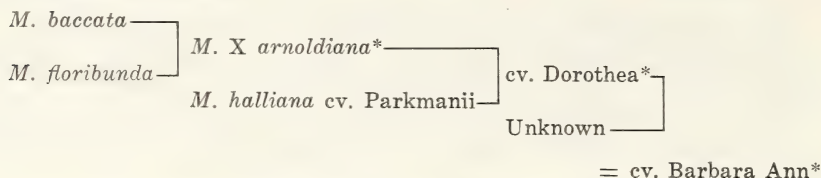
cv. Athabasca

M. pumila var. *niedzwetzkyana* X *M. baccata*.

Originated from a cross made by Miss Isabella Preston in 1921. Introd. by Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Named in 1933 for Athabasca Lake in northwestern Saskatchewan and northeastern Alberta, Canada.

Description: Flowers; single, expanding buds purplish red, open pale purplish pink with white claw, approx. 4.5 cm. across. Fruit; yellowish orange to red, approx. 4 cm. in diam. Disease free (41).

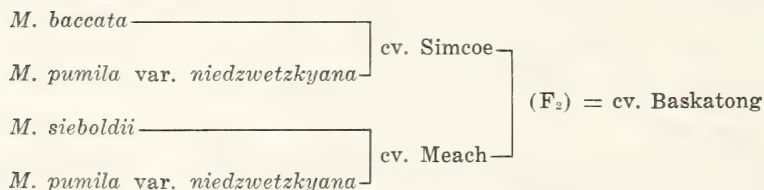
Locations: (H), (I), (O), (Q).

cv. Barbara Ann*

An open pollinated seedling of *M. cv. Dorothea** possibly crossed with an unknown clone of *M. X purpurea*. Originated at the Arnold Arboretum in 1953. Selected by Karl Sax and named by Donald Wyman for his youngest daughter. Introd. by the Arnold Arboretum in 1966. First flowers noted in 1960. Disease free (41).

Description: Flowers; double (12–15 petals), deep purplish pink, fading to a lighter purplish pink, approx. 4.5 cm. across. Fruit; purplish red, approx. 1.2 cm. in diam.

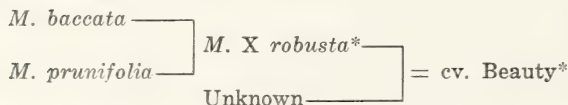
Location: (C).

cv. Baskatong

A second generation (F_2) hybrid that originated at the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada, before 1950. Named for Baskatong Lake, 90 miles north of Ottawa, Canada, at foot of Mt. Sir Wilfred.

Description: Flowers; single, expanding buds dark purple red, open light purplish red with white claw, approx. 4.5 cm. across. Fruit; dark purplish red with many russet marks, approx. 2.5 cm. in diam.

Locations: (B), (H), (I), (R).

cv. Beauty*

A seedling raised by Niels E. Hansen from *Malus X robusta** seed received from the Botanical Gardens at Petrograd, Russia.

Introd. in 1919 by South Dakota Agricultural Experiment Station, Brookings, S. Dak. The name "Beauty" refers to the fruit Disease free (41).

Description: Flowers; single, expanding buds pink to rose pink, open white and pinkish white, approx. 5 cm. across. Fruit; dark red, approx. 4 cm. in diam. Fastigiate habit.

Location: (B).

Progeny of *M. cv. Beauty**:

*M. cv. Midnight** (Wright, P. H.)

cv. Bedford*

A seedling of *M. cv. Cluster* (apple).

Originated before 1928. Introd. by Expt. Farm, Research Branch, Canada Dept. of Agr., Brandon, Manitoba. Extremely hardy.

Description: Flowers; single, expanding buds deep rose red, open pinkish white, approx. 4.2 cm. across. Fruit; pale yellow flushed with pale or dark carmine, approx. 3.8 cm. in diam. Disease free (41).

Location: (I).

cv. Big River

<i>M. pumila</i> var. <i>niedzwetzkyana</i>] <i>M. baccata</i> cv. <i>Hopa*</i>	= cv. Big River*
<i>M. baccata</i>		

An open pollinated seedling of *M. baccata*, probably pollinated by *M. cv. Hopa**.

Introd. about 1944 by Percy H. Wright, Moose Range, Saskatchewan, Canada. Extremely hardy.

Description: Flowers; single, deep rose pink to purplish red, approx. 4.5 cm. across. Fruit; bright red, approx. 0.8 cm. in diam.

Locations: (H), (I).

cv. Blanche Ames*

An open pollinated seedling of *M. spectabilis* cv. *Riversi**.

Originated at the Arnold Arboretum and selected by Karl Sax in 1939. Introd. by the Arnold Arboretum in 1947. Formerly A.A. 6639. Named for Mrs. Oakes Ames, wife of a former supervisor at the Arnold Arboretum. Disease free (41).

Description: Flowers; semidouble, pink and white, approx. 3.5 cm. across. Fruit; yellow, approx. 0.8 cm. in diam.

Locations: (C), (N), (S).

cv. Bob White*

A chance seedling of unknown parentage occurring in Massachusetts before 1876.

Introd. into cultivation by the Arnold Arboretum.

Description: Flowers; single, expanding buds pink, open white,

approx. 2.5 cm. across. Fruit; yellow to brownish yellow, approx. 1.3 cm. in diam.

Location: (J).

cv. Burton*

A chance seedling occurring at Burton's Nursery Company, Casstown, Ohio, about 1937. Syns: *M. cv. Burtoni*; *M. cv. Burton's Yellow Fruiter*; *M. cv. Burton's Yellow Fruited*. Disease free (41).

Description: Flowers; single, expanding buds pink, open white. Fruit; yellow.

Location: (E).

cv. Cal Trio

*M. cv. Mercer** (apple) X *M. cv. Sweet Russet* (apple).

Originated by Niels E. Hansen. Introduced in 1938 by South Dakota Agricultural Experiment Station, Brookings, S. Dak.

Description: Flowers; single, expanding buds white with some purplish pink, open white to pinkish white, approx. 4 cm. across. Fruit; greenish yellow with dark red cheek, approx. 4 cm. in diam.

Location: (B).

cv. Callaway*

A Callaway Gardens, Pine Mountain, Ga., selection from seedlings originally purchased in 1954 as *M. sieboldii*. Specimen later identified by Donald Wyman, Arnold Arboretum, and A. F. den Boer, Des Moines, Iowa, as a seedling of *M. prunifolia*. Syn: *M. cv. Callaway*; *M. cv. Ida Cason*.

Named in 1964 for Callaway Gardens and introduced commercially by the Commercial Nursery Company, Decherd, Tenn.

Description: Flowers; expanding buds light pink, open white. Fruit; red, approx. 2 cm. in diam.

Location: (G).

cv. Calros*

Open pollinated seedling of *M. cv. Blushed Calville* (apple).

Introduced in 1934 by Experimental Farm, Canada Dept. of Agr., Rosthern, Saskatchewan, Canada. The name "Calros" is a combination of "CAL" from Calville and "ROS" from Rosthern.

Description: Fruit; yellow and crimson, approx. 3 cm. in diam.

Location: (Q).

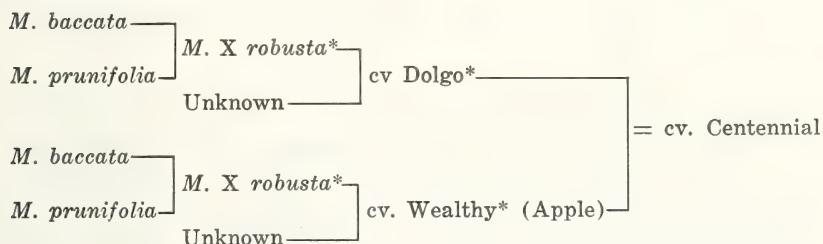
cv. Caramel*

A seedling selection by Niels E. Hansen. Grown from mixed apple seeds. Syn: *M. cv. Carmel*.

Introd. in 1919 by South Dakota Agricultural Experiment Station, Brookings, S. Dak. Named "Caramel" because of the sweet taste of the fruit.

Description: Flowers; single, expanding buds light pink, open pinkish white, approx. 4 cm. across. Fruit; yellowish green to orange yellow, red cheek, approx. 5 cm. in diam. Disease free (41).

Location: (Q).

cv. Centennial

Originated in 1957 and introd. by Univ. of Minnesota State Fruit Farm, Excelsior, Minn. Disease free (41).

Description: Flowers; white. Fruit; bright red over yellow, approx. 4.8 cm. in diam.

Location: (R).

cv. Chestnut*

Open pollinated seedling of *M. cv. Malinda** (apple).

Discovered at Univ. of Minnesota State Fruit Farm, Excelsior, Minn. Selected in 1921. Introd. into cultivation in 1946. Named "Chestnut" because of the nutlike taste of the fruit. Formerly Minnesota No. 240. Disease free (41).

Description: Flowers; white. Fruit; approx. 5 cm. in diam.

Locations: (I), (R).

cv. Chilko*

An open pollinated seedling of *M. pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Chilko Lake in southwestern British Columbia.

Description: Flowers; single, expanding buds deep purplish red, open purplish pink, approx. 5 cm. across. Fruit; bright red to crimson, approx. 5 cm. in diam.

Locations: (H), (I).

cv. Columbia

M. baccata X *M. cv.* Broad Green (apple).

Originated as a cross made in 1904 by William Saunders. Named in 1911 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Extremely hardy. Occasionally used as stock for grafting other crabapple scions.

Description: Flowers; single, expanding buds rose red, open white, approx. 4.8 cm. across. Fruit; yellow to orange yellow streaked with light red to dark red, approx. 4.5 cm. in diam.

Locations: (B), (I).

cv. Cowichan*

An open pollinated seedling of *M. pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Cowichan Lake in southwestern British Columbia.

Description: Flowers; single, expanding buds pale rose red, open pale lavender, almost white, approx. 4.5 cm. across. Fruit; bright carmine with some pale yellow or ivory, approx. 3.8 cm. in diam.

Locations: (A), (B), (C), (H), (I), (L), (P), (Q).

cv. Crimson Brilliant* (Plant Patent No. 939)

M. baccata —————

M. pumila var. *niedzwetzkyana* —

cv. Jay Darling*

Unknown —————

= cv. Crimson Brilliant*

An open pollinated seedling discovered in 1939 in a group of seedlings at the Des Moines Water Works, Des Moines, Iowa. Named by Arie F. den Boer. Introd. by Wayside Gardens, Mentor, Ohio, in 1952. Plant patent assigned in 1950 to John G. Grullemans of Wayside Gardens.

Description: Flowers; single and semidouble, expanding buds deep purplish red, open rose red to bright rose pink with pale lavender star at base of petals, approx. 4 cm. across. Fruit; dark purplish red with russet marks, approx. 2 cm. in diam.

Locations: (B), (C), (E), (T).

into cultivation by the Arnold Arboretum in 1948. Named for a daughter of Donald Wyman. Syn: *M. cv. Dorthea*.

Description: Flowers; semidouble (10–16 petals), expanding buds carmine, open rose pink not fading to white, approx. 4.5 cm. across. Fruit; yellow, approx. 1.3 cm. in diam.

Locations: (C), (D), (L), (O), (S).

Progeny of *M. cv. Dorothea**:

*M. cv. Barbara Ann**

cv. E. H. Wilson*

Origin and parentage unknown.

Introd. before 1931 by William Sim Nursery, Cliftondale, Mass.

Description: Flowers; single, expanding buds carmine to rose pink, open white, approx. 4.8 cm. across. Fruit; orange and red to red, approx. 3 cm. in diam.

Location: (C).

cv. Erie*

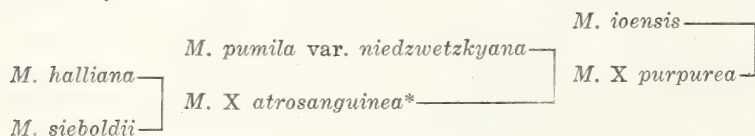
An open pollinated seedling of *M. pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Lake Erie.

Description: Flowers; single, expanding buds purplish red, open rose pink to lavender with pale lavender claw, approx. 5 cm. across. Fruit; dark red to orange, approx. 2.5 cm. in diam.

Locations: (H), (I), (O).

cv. Evelyn*



= cv. Evelyn*

An open pollinated seedling of *M. ioensis* possibly crossed with *M. X purpurea*. Syns: *M. ioensis* (Seedling Red No. 1); *M. cv. Red Leaf*.

Selected in 1939 by Arie F. den Boer at the Des Moines Water Works, Des Moines, Iowa, from a large number of *M. ioensis* seedlings. Named in 1953 by den Boer for a daughter-in-law, but introd. by den Boer before 1953 as *M. ioensis* (Seedling Red No. 1).

Description: Flowers; single, expanding buds deep rose red, open rose red to deep rose red, approx. 3.5 cm. across. Fruit; greenish yellow and red, approx. 3.5 cm. in diam.

Locations: (A), (B), (C), (O), (P), (R).

cv. Exzellenz Thiel*

A hybrid of doubtful parentage, possibly a cross between *M. floribunda* X *M. prunifolia* cv. Pendula. Syn: *Malus thiel*.

Selected about 1909 and introd. into cultivation by the Ludwig Späth Nurseries, Berlin, Germany. Introd. into the U.S.A. in 1912 by the Arnold Arboretum. A small tree with pendulous branches.

Description: Flowers; single, expanding buds rose red, open white, approx. 4.5 cm. across. Fruit; orange yellow with reddish cheek, approx. 1.8 cm. in diam.

Locations: (B), (O).

Progeny of *M.* cv. Exzellenz Thiel*:

M. cv. Oekonomierat Echtermeyer* (Späth)

M. cv. Pixie* (den Boer)

M. cv. Red Jade* (Reed)

M. cv. Seafoam* (den Boer)

cv. Ferrill's Crimson*

An open pollinated seedling of unknown parentage.

Introd. by Ferrill's Nursery, Salem, Oreg., before 1953. Disease free (41).

Description: Flowers; single, purplish red, approx. 3.5 cm. across. Fruit; red, approx. 1.5 cm. in diam. Disease free (41).

Locations: (C), (S).

cv. Flame*

A selection of unknown parentage grown from a group of apple seedlings.

Discovered in 1920 and introd. in 1934 by the Univ. of Minnesota Fruit Breeding Farm, Excelsior, Minn. Formerly *M.* Minnesota No. 635. The name refers to the red fruit color. Extremely hardy.

Description: Flowers; single, white, expanding buds pink, open white. Fruit; bright red, approx. 2 cm. in diam.

Locations: (A), (I), (P), (R).

cv. Garnet*

Parentage unknown.

Introd. by Boughen Nurseries, Valley River, Manitoba, Canada, before 1942.

Description: Flowers; single, pink and white. Fruit; red to purplish red, approx. 5 cm in diam.

Location: (I).

cv. Garry*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*.

Introd. by the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Named in 1962. Formerly MR 455.

Description: Flowers; expanding buds maroon, open deep rose red. Fruit; crimson with heavy waxy bloom, approx. 2 cm. in diam., remaining on the tree all winter.

Locations: (H), (M), (O), (T).

cv. Geneva*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930.

Description: Flowers; single, expanding buds pink, open white, approx. 3 cm. across. Fruit; red, approx. 5 cm. in diam.

Locations: (A), (H).

cv. Gibbs' Golden Gage*

Parentage unknown.

Originated as a chance seedling at Aldenham House Gardens, Elstree, Hertfordshire, England. Introd. in England before 1923. Disease free (41).

Description: Flowers; single, expanding buds pink, open white. Fruit; yellow, approx. 2.5 cm. in diam.

Location: (P).¹¹

cv. Gladwyne

M. angustifolia X *M. ioensis* cv. Plena.

Raised from a cross made in 1939 by Mrs. Norman J. Henry of Gladwyne, Pa.

Locations: (C), (D).

cv. Golden Anniversary*

Parentage unknown.

Originated in the nursery of the Oscar H. Will Company, Bis-

¹¹ Received Mar. 3, 1925, at U.S. Dept. of Agr., Plant Introduction Station, Glenn Dale, Md., from Hon. Vicary Gibbs of Aldenham House Gardens. The accession was assigned U.S.D.A. Plant Introduction No. 62733, and plants were later sent to the U.S. National Arboretum.

marck, N. Dak. Named "Golden Anniversary" as it was introd. in 1931 during the 50th anniversary of the Oscar H. Will Co.

Description: Flowers; single, white. Fruit; yellow with red blush, approx. 2.5 cm. in diam.

Location: (Q).

cv. Golden Hornet*

Probably a chance seedling of *M. sieboldii* var. *zumi* cv. Calocarpa.

Introd. before 1949 by John Waterer & Sons, Bagshot, Surrey, England. Disease free (41).

Description: Flowers; single, white, approx. 3 cm. across. Fruit; yellow, approx. 2.8 cm. in diam.

Locations: (C), (H), (P), (Q).

cv. Goldfinch*

Parentage unknown, probably a seedling of *M. baccata*.

Raised from seed found under a tree at the Arnold Arboretum, about 1920, by Mrs. Horatio Gates Lloyd of Haverford, Pa. Introd. into cultivation about 1953 by Swarthmore College, Swarthmore, Pa. Named "Goldfinch" by Swarthmore College because of its yellow fruit.

Description: Flowers; single, white, approx. 3.5 cm. across. Fruit; yellow, approx. 1 cm. in diam.

Locations: (B), (C), (D).

cv. Gorgeous

M. sieboldii X *M. halliana* (32).

Introd. into U.S.A. in 1925 by U.S. Dept. of Agr., Plant Introduction Station, Glenn Dale, Md. (U.S.D.A. Plant Introduction No. 64833), through accessions received from the original introducer, Hayward R. Wright, Avondale, Auckland, New Zealand. Name refers to attractive fruit. Syn: *M.* cv. Georgeous.

Description: Flowers; single, expanding buds pink, open white, approx. 3.2 cm. across. Fruit; crimson to orange red, approx. 2.5 cm. in diam.

Location: (P).

Progeny of *M.* cv. Gorgeous:

M. cv. Bledisloe (Wright, H. R.)

M. cv. Crimson Glory (Wright, H. R.)

M. cv. Elsie Burgess (Wright, H. R.)

M. cv. Jack Humm (Nairn)

M. cv. Sovereign (Nairn)

M. cv. Wright's Scarlet (Wright, H. R.)

cv. Henry Kohankie*

A seedling selection grown from seed of *M. sieboldii* received from Japan in 1933 by the Henry Kohankie Nurseries, Painesville, Ohio.

Registered by Dr. George W. Parmelee, Michigan State Univ., East Lansing, Mich., on March 23, 1965. Named for Henry Kohankie of the Henry Kohankie Nurseries.

Description: Flowers; single, expanding buds pale pink, open pinkish white to white, approx. 3.5 cm. across. Fruit; glossy red, ellipsoidal, approx. 3 cm. in diam., persistent and very decorative after leaf fall and throughout most of winter.

Locations: (E), (N).

cv. Hillier*

Parentage unknown.

Selected at Hillier and Sons Nurseries, Winchester, England, from a group of plants obtained from an unknown European source. Introduced into U.S.A. in 1928 by The Morton Arboretum. Named for Hillier & Sons Nurseries. Syns: *M. floribunda* cv. Hillieri; *M. hillieri*; *M. cv. Hillier Crab*.

Description: Flowers; single and semidouble (5–9 petals), expanding buds rose red, open pink to pale pink, approx. 3.3 cm. across. Fruit; yellow to orange, approx. 1.7 cm. in diam.

Locations: (B), (H).

cv. Hopa*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*, probably crossed with *M. baccata* (26). Syns: *M. cv. Hansen's Red Leaf Crab*; *M. cv. Hoppi*; *M. cv. Pink Sunburst*; *M. cv. Sunburst*.

Selected by Niels E. Hansen and introduced in 1920 by the South Dakota Agricultural Experiment Station, Brookings, S. Dak. "Hopa" means beautiful in Sioux Indian language.

Description: Flowers; single, expanding buds dark red to purplish red, open rose pink with almost white star in the center, approx. 4.3 cm. across. Fruit; bright red or crimson, usually yellowish on shaded side, approx. 2.5 cm. in diam.

Location: (I).

Progeny of *M. cv. Hopa**:

*M. cv. Big River** (Wright, P. H.)

*M. cv. Mount Arbor Special** (Welch)

*M. cv. Patricia** (den Boer)

*M. cv. Radiant** (Univ. of Minn.)

*M. cv. Vanguard** (Univ. of Minn.)

M. cv. White Fox River (Wright, P. H.)

cv. (Hopa Seedling No. 1)

A numbered selection from the Provincial Horticultural Station, Brooks, Alberta, Canada.

Description: Flowers; single, expanding buds deep purplish red, open purplish red forming a star smaller than that of cv. Hopa*, approx. 5 cm. across. Fruit; purplish red, paler red to bronze on shaded side, approx. 3.5 cm. in diam.

Locations: (I), (Q).

cv. (Hopa Seedling No. 3)

A numbered selection from the Provincial Horticultural Station, Brooks, Alberta, Canada.

Location: (I).

cv. Huron

M. pumila var. *niedzwetzkyana* X *M. baccata* cross made by Miss Isabella Preston before 1930.

Introd. by Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Named for Lake Huron.

Description: Flowers; single, expanding buds purplish red, open amaranth pink with red anthers, strongly fragrant, approx. 4.5 cm. across. Fruit; bright red, oval in shape and bitter, approx. 3.4 cm. in diam.

Location: (H).

cv. Irene*

<i>M. baccata</i> —————] cv. Jay Darling*]	= cv. Irene*
<i>M. pumila</i> var. <i>niedzwetzkyana</i> —————		
	Unknown —————	

An open pollinated seedling discovered in 1939 by Arie F. den Boer among a group of seedlings at the Des Moines Water Works. Named by den Boer of Des Moines, Iowa, and introd. in 1951. Similar to and from the same seedling lot as *M. cv. Crimson Brilliant** but of smaller habit. Formerly Jay Darling Seedling No. 166. Registered with the American Association of Nurserymen by A. V. Keller.

Description: Flowers; single, occasionally with six petals, expanding buds deep carmine, open rose red fading to rose pink nearly white at base of petals, approx. 4.6 cm. across. Fruit; dark purplish red to purplish maroon and lighter on shaded side, approx. 2.5 cm. in diam.

Location: (R).

cv. J. L. Pierce*

Discovered in 1955 in the Detroit, Mich., garden of Mr. and Mrs. J. L. Pierce, by Milton Baron of Michigan State Univ. Original plant, destroyed by fireblight around 1963, was purchased from the Henry Kohankie Nurseries, Painesville, Ohio, as *M. zumi* cv. Calocarpa.

Introd. by Michigan State Univ., East Lansing, Mich. Michigan State Univ. considers this cultivar to be a form of *M. X robusta** with much more lustrous foliage.

Description: Flowers; single, white. Fruit; red, approx. 1.3 cm. in diam.

Location: (E).

cv. Jenison*

Probably originated among a group of unnamed seedlings distributed around 1940 by the Arnold Arboretum.¹² The named specimen is located near the main entrance of Jenison Gymnasium on the campus of Michigan State Univ., East Lansing.

Introd. by Michigan State University before 1966.

Description: Flowers; single, white. Fruit; pyriform in shape, bright red, approx. 1.8 cm. in diam.

Location: (E).

cv. Joan¹³

Listed by Wyman (67) as a clone of *M. X robusta**.

Discovered in 1918 near Smith Street, Rochester, N.Y., by John Dunbar, former propagator for the Rochester Parks System. Named for his granddaughter.

Description: Flowers; single, white, approx. 5 cm. across. Fruit; red and yellow, approx. 3.5 cm. in diam.

Locations: (C), (O), (S).

cv. Jubilee*

<i>M. pumila</i> var. <i>niedzwetzkyana</i>	}	cv. Hopa*	}	= cv. Jubilee*
<i>M. baccata</i>				

¹² In 1939 the Arnold Arboretum offered for distribution approximately 2,000 unnamed young crabapple plants. These plants were all open pollinated seedlings of other Arnold Arboretum crabapples. For a more detailed account of the proposed distribution of these plants, see Skirm, G. W. (54).

¹³ Not to be confused with *M. cv. Joan* (*M. cv. Anisim* (apple) X *M. cv. Jonathan* (apple). See Fisher, H. H. (25, p. 122).

An open pollinated seedling introd. by the Provincial Horticultural Station, Brooks, Alberta, Canada. First distributed by introducer in 1937 as B.F. #6. Named Jubilee by introducer in 1955. Extremely hardy.

Locations: (C), (I).

cv. Judy*

An open pollinated seedling of unknown parentage.

Introd. by Hook's Nursery, Lake Zurich, Ill. Selected from a group of seedlings raised from seed received as *M. zumi* from Herbst Brothers, New York, N.Y., shortly after World War II. The seeds were said to have come from Japan.

Description: Flowers; expanding buds pink, open white. Fruit; yellow with blush cheek, approx. 1.3 cm. in diam. Persistent and extremely abundant.

Location: (E).

cv. Katherine*

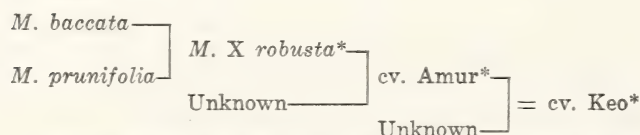
A chance seedling, probably *M. halliana* X *M. baccata* (64). Syn: *M. cv. Catherin*.

Discovered by Bernard H. Slavin of the Rochester Parks System about 1928 growing at Durand-Eastman Park, Rochester, N.Y. Named by Donald Wyman at Mr. Slavin's request for his daughter-in-law, Katherine Clark Slavin. Introd. by the Arnold Arboretum in 1943. Clonotype, as of this publication, still growing at Durand-Eastman Park under accession number 966.

Description: Flowers; double (15-24 petals), expanding buds deep pink, open pink fading to white, approx. 5.4 cm. across. Fruit; yellow with a red cheek, approx. 1 cm. in diam.

Locations: (C), (J), (O).

cv. Keo*

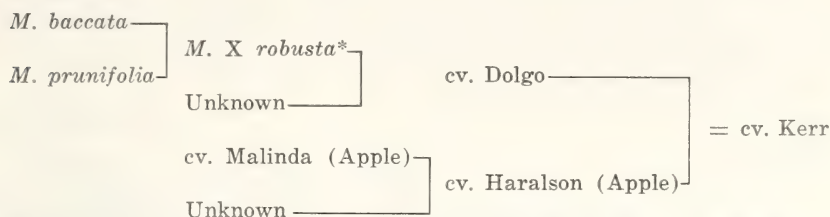


An open pollinated or self-pollinated seedling selected by Niels E. Hansen (30) and introd. in 1940 by South Dakota Agricultural Experiment Station, Brookings, S. Dak.

Description: Flowers; single, expanding buds rose red, open pink fading to white with slight touches of pink, approx. 5 cm. across. Fruit; carmine with some yellow or green, approx. 4.3 cm. in diam.

Location: (B).

cv. Kerr



Introd. by Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada, from a cross made by W. L. Kerr in 1938. Formerly Morden 352.

Description: Flowers; single, white. Fruit; yellow and red, approx. 4 cm. in diam.

Locations: (C), (I).

cv. Kibele*

A chance seedling originating before 1949 on the south edge of Springfield, Ill. Later moved to the back yard of Mr. and Mrs. R. R. Kibele for whom it was named. Formerly Morton Arboretum #447-59. Disease free (41).

Introd. by Clarice Hickox, Springfield, Ill.

Location: (O).

cv. Kingsmere

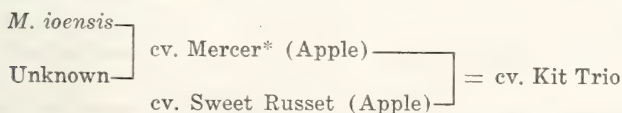
M. sieboldii X *M. pumila* var. *niedzwetzkyana*.

Introd. by Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made by Miss Isabella Preston in 1920. Named in 1930 for Lake Kingsmere in Ontario, Canada. Considered by Arie den Boer (22) to be "one of the loveliest of all Canadian hybrids."

Description: Flowers; single, expanding buds deep carmine, open purplish pink, approx. 5 cm. across. Fruit; crimson over purplish brown, shaded side greenish brown, approx. 3 cm. in diam.

Locations: (O), (P).

cv. Kit Trio



Introd. in 1938 by South Dakota Agricultural Experiment Sta-

tion, Brookings, S. Dak. Originated from a cross made by Niels E. Hansen.

Description: Flowers; single, expanding buds coral red, open pinkish white, approx. 3.8 cm. across. Fruit; orange yellow with a few scattered carmine spots, approx. 4.5 cm. in diam.

Location: (B).

cv. Kola

M. coronaria cv. Elk River X *M.* cv. Oldenburg (apple).

Introd. in 1922 by South Dakota Agricultural Experiment Station, Brookings, S. Dak. Originated from a cross made by Niels E. Hansen.

Determined by Bernhard Nebel, Agr. Experiment Station, Geneva, N.Y., to be a tetraploid with 68 chromosomes. This was the first known tetraploid among cultivated crabapples and apples (30). Considered by Arie F. den Boer to be an excellent ornamental for large parks (22). To the Sioux Indian, "Kola" means friend.

Description: Flowers; single, expanding buds rose to salmon pink, open pale pink, approx. 4.6 cm. across. Fruit; greenish yellow, fragrant, approx. 5 cm. in diam.

Location: (I).

cv. Lady Northcliffe*

Of uncertain parentage. Listed by Donald Wyman (67) as a *M. baccata* clone.

Discovered before 1929 at Aldenham House Gardens, Elstree, Hertfordshire, England. Introd. into the U.S.A. by The Morton Arboretum, Lisle, Ill.

Description: Flowers; single, expanding buds rose red, open pale pink fading to white, approx. 2.7 cm. across. Fruit; yellow and red, approx. 1.4 cm. in diam.

Location: (C).

cv. Leslie¹⁴

An open pollinated seedling of an unknown Rosybloom crabapple. Syns: *M.* cv. Leslie Copper Leaf; *M.* cv. Leslie Redleaf crabapple.

Originated at Northwest Nursery Co., Valley City, N. Dak., from seed received from the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Named in 1945 for W. R. Leslie of the Canada Dept. of Agr., Morden, Manitoba, Canada,

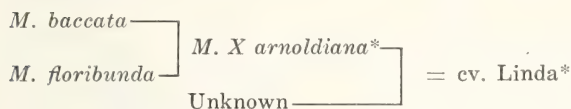
¹⁴ Not to be confused with *M.* cv. Leslie, an apple listed by Ragan, W. H. (45).

by the Northwest Nursery Co. Foliage purple-red to bronze throughout summer. Formerly VC #3.

Description: Flowers; single, deep purple red. Fruit; dark red, approx. 1 to 1.5 cm. in diam.

Locations: (A), (I).

cv. Linda* ¹⁵



A chance seedling selected by Arie F. den Boer of Des Moines, Iowa, from a group of open pollinated *M. X arnoldiana** seedlings growing at Des Moines Water Works. Named in 1958 by den Boer for his granddaughter Linda E. den Boer. Disease free (41).

Description: Flowers; single, expanding buds rose red to carmine, open pale pink, approx. 4.5 cm. across. Fruit; bright to dark crimson, approx. 2.8 cm. in diam.

Locations: (E), (O).

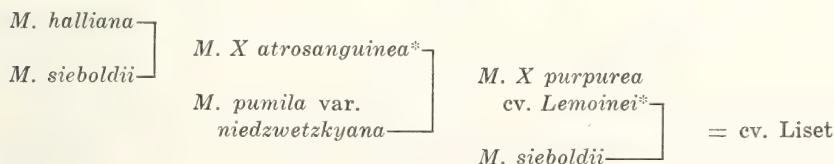
cv. Lisa*

A chance seedling selected by Arie F. den Boer of Des Moines, Iowa, from a group of open pollinated *M. ioensis* seedlings growing at the Des Moines Water Works. Named in 1958 by den Boer for his granddaughter Lisa M. den Boer. Formerly *M. ioensis* (Seedling Red No. 2).

Description: A slow-growing small tree with purplish young leaves. Flowers; single, expanding buds rose red to carmine, open rose red to light carmine, approx. 2.7 cm. across. Fruit; orange yellow and carmine or carmine all over, approx. 2.5 cm. in diam.

Location: (O).

cv. Liset



¹⁵ Not to be confused with *M. cv. Linda* Sweet crabapple introduced by N. E. Hansen in 1922, nor with the apple *M. cv. Linda* (a seedling of Langford Beauty (apple)) originated at the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada.

Grown from a cross made before 1938 by S. G. A. Doorenbos, Dept. of Parks, The Hague, Holland. Named by Doorenbos in 1952 for his granddaughter. S. G. A. Doorenbos first named this cultivar *M. cv. Success* in 1951. The name was later changed to *Liset* when he discovered *Success* had previously been used for another *Malus* cultivar. Syns: *M. cv. Lizette*; *M. cv. Lizet*. Formerly *M. X moerlandsi* ± 8 , a name used by S. G. A. Doorenbos of The Hague, Holland, for crosses of *M. X purpurea* cv. *Lemoinei** X *M. sieboldii*.

Description: Flowers; single, expanding buds dark crimson, open rose red to light crimson, approx. 3.8 cm. across. Fruit; dark crimson to maroon red, glossy, approx. 1.3 cm. in diam.

Location: (B).

cv. Magnus

M. prunifolia X *M. cv. (Simbirsk No. 9)* (apple).

Originated and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Grown from a cross made in 1904 by William Saunders and named in 1911.

Description: Fruit; pale yellow and scarlet, approx. 4.5 cm. in diam.

Locations: (I), (Q).

cv. Makamik*

An open pollinated seedling of *M. pumila* var. *niedzwetzkiana*. Syn: *M. cv. Makamic*.

Originated in 1921 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1933 for Makamik Lake in western Quebec, Canada.

Description: Flowers; single, expanding buds dark red, open purplish red fading to a lighter tint, approx. 4.8 cm. across. Fruit; carmine, approx. 2.6 cm. in diam.

Locations: (A), (D), (H), (I), (L), (P), (Q).

cv. Mary Potter

	<i>M. sargentii</i> cv. <i>Rosea</i>	} = cv. Mary Potter
<i>M. halliana</i>	} <i>M. X atrosanguinea</i> *	
<i>M. sieboldii</i>		

Originated from a cross made in 1939 by Karl Sax of the Arnold Arboretum. Introd. in 1947 by the Arnold Arboretum. This

cultivated variety, which tends to breed true from open pollinated seed, is a triploid (67). Named for a daughter of Charles S. Sargent, a former director of the Arnold Arboretum. Formerly AA 17039.

Description: Flowers; single, expanding buds pink, open white, approx. 2.7 cm. across. Fruit; red, approx. 1.2 cm. in diam.

Locations: (C), (E), (N), (O), (P), (S).

cv. Meach

M. sieboldii X *M. pumila* var. *niedzwetzkyana*.

Originated from a cross made in 1920 by Miss Isabella Preston. Named in 1930 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Named for Meach Lake located in the province of Quebec, near Ottawa, Canada.

Description: Flowers; single, purplish red, approx. 5 cm. across. Fruit; red, approx. 2.3 cm. in diam.

Location: (I).

Progeny of *M.* cv. Meach:

M. cv. Baskatong (C.D.A., Ottawa)

M. cv. Tomiko (C.D.A., Ottawa)

cv. Mecca

M. baccata X *M.* cv. (Simbirsk No. 9) (apple).

Introd. and named in 1911 by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in 1904 by William Saunders.

Description: Fruit; red, approx. 4 cm. in diam.

Locations: (I), (Q).

Progeny of *M.* cv. Mecca:

M. cv. Mecca-Dolgo (C.D.A., Ottawa?)

cv. Midnight*

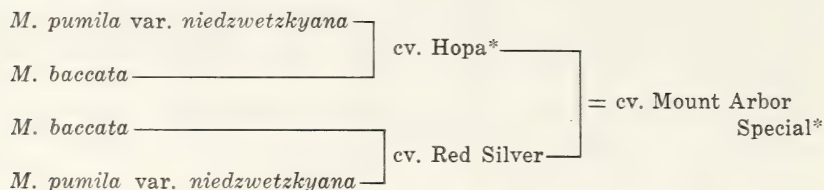
M. baccata—
M. prunifolia—
 Unknown—
 Unknown—

M. X *robusta**
 cv. Beauty*
 = cv. Midnight*

An open pollinated seedling, introd. and named in 1953 by Percy H. Wright, Moose Range, Saskatchewan, Canada. Considered outstanding because of its dark foliage and extreme hardiness.

Descriptions: Flowers; expanding buds carmine, open pink, approx. 3.5 cm. across.

Location: (C).

cv. Mount Arbor Special*

An open pollinated seedling of *M. cv. Hopa**, probably crossed with *M. cv. Red Silver*. Syn: *M. cv. Mount Arbor*.

Originated about 1937 at Mount Arbor Nurseries, Shenandoah, Iowa. Selected by G. L. Welch, former president of Mount Arbor Nurseries, and introd. in 1939. Disease free (41).

Description: Flowers; single, expanding buds carmine, open reddish pink. Fruit; purplish red, approx. 2 cm. in diam.

Location: (C).

cv. Muskoka

M. pumila var. *niedzwetzkyana* X *M. baccata*.¹⁶

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in 1920 by Miss Isabella Preston. Named in 1930 for Muskoka Lake in southern Ontario, Canada.

Description: Flowers; single, expanding buds carmine, open pink, approx. 2.5 cm. across. Fruit; dark red, approx. 2.5 cm. in diam.

Location: (I).

cv. Namew

M. pumila var. *niedzwetzkyana* X *M. baccata*. Syn: *M. cv. Nameu*.

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated in 1921 from a cross made by Miss Isabella Preston. Named for Namew Lake in Saskatchewan, Canada.

Description: Flowers; single, expanding buds reddish purple, open pink, approx. 5 cm. across. Fruit; dark red, approx. 2.5 cm. in diam.

Locations: (H), (I).

¹⁶ The *M. baccata* species used in this cross originally came from Ludwig Späth Nurseries, Berlin, Germany, in 1903 as *M. baccata* cv. *Jenensis*, along with several others selected for the varying leaf and fruit shapes. This particular plant has since been identified as *M. baccata* Borkh.

cv. Nipissing

M. pumila var. *niedzwetzkyana* X *M. baccata*.¹⁷

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in 1920 by Miss Isabella Preston. Named in 1930 for Nipissing Lake in southeast central Ontario, Canada.

Description: Flowers; single, expanding buds carmine red, open pale rose pink to pale lavender, approx. 4.2 cm. across. Fruit; mostly dark red with orange yellow, shaded side bronze green, approx. 3.5 cm. in diam.

Locations: (I), (O), (Q).

cv. Oakes*

An open pollinated seedling. Selected and introd. by William Oakes, Glenelm Nursery, Miami, Manitoba, Canada. This cultivar has been mistakenly listed as being the same as the introduction MR 450 of the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada.

<i>M. pumila</i> var. <i>niedzwetzkyana</i>	}	cv. Scugog*	}	= cv. Oakes*
Unknown				
		Unknown		

Description: Flowers; single, purplish red. Fruit; dark red, approx. 4 cm. in diam.

Location: (I).

cv. Oekonomierat Echtermeyer*

<i>M. floribunda</i>	}	cv. Exzellenz Thiel*	}	= cv. Oekonomierat Echtermeyer*
<i>M. prunifolia</i> cv. Pendula				
<i>M. pumila</i> var. <i>niedzwetzkyana</i>				

Introd. in 1914 by the Ludwig Späth Nurseries, Berlin, Germany. Syns: *M. cv. Echtermeyer*; *M. X gloriosa* cv. Oekonomierat Echtermeyer; *M. cv. Hugo Echtermeyer*; *M. cv. Pink Weeper*; *M. X purpurea* cv. Pendula.

Description: Habit; semiweeping. Flowers; single, expanding buds deep purplish red, open purplish pink, approx. 4 cm. across. Fruit; purplish red before ripening, later turning a dark reddish brown to greenish brown, approx. 2.5 cm. in diam.

Locations: (O), (P), (Q).

¹⁷ See footnote 16.

Progeny of *M. cv. Oekonomierat Echtermeyer**:

*M. cv. Pixie** (den Boer)

*M. cv. Seafoam** (den Boer)

cv. Ormiston Roy*

Origin and parentage unknown.

Introd. in 1954 and named by Arie den Boer of Des Moines, Iowa, for William Ormiston Roy, a landscape architect of Montreal, Canada. William Ormiston Roy found the selection growing in Des Moines, before 1933, and brought it to the attention of Arie den Boer. Fruits remain on tree throughout the entire winter. Disease free (41).

Description: Flowers; single, expanding buds rose red turning pale rose pink, open white, approx. 4 cm. across. Fruit; orange yellow with reddish blush, approx. 1.2 cm. in diam.

Locations: (A), (D), (E), (O), (N).

cv. Osman

M. baccata X *M. cv. Osimoe* (apple).

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated before 1904 from a cross made by William Saunders. Named about 1911. Extremely hardy. Disease free (41).

Description: Flowers; single, expanding buds pink, open white occasionally slightly flushed with pink, approx. 5 cm. across. Fruit; yellow and red, approx. 3.8 cm. in diam.

Locations: (B), (I), (Q).

cv. Patricia*

<i>M. pumila</i> var. <i>niedzwetzkyana</i>	}	cv. Hopa*	}	= cv. Patricia*
<i>M. baccata</i> —————				
		Unknown		

Introd. by Arie den Boer, Des Moines Water Works, Des Moines, Iowa. Originated as a chance seedling which was selected by Arie den Boer and named in 1953 for a daughter-in-law. Formerly *M. cv. (Hopa* seedling No. 2)*.

Description: Flowers; single, expanding buds maroon red to deep purplish red, open purple with white claw, approx. 5 cm. across. Fruit; yellow and red, approx. 4.5 cm. in diam.

Location: (A).

cv. Pink Beauty

M. baccata X *M. pumila* var. *niedzwetzkyana*.

Originated at the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Released under Number M.R. 451. Named before 1958 by Simpson Orchard Co., Vincennes, Ind.

Description: Flowers; single, pink. Fruit; red, approx. 2.3 cm. in diam.

Location: (P).

cv. Pink Eye*

Of unknown parentage, probably of Canadian origin. Syns: *M. cv. Dakota Pink Eye*; *M. cv. Diamond Jubilee*; *M. cv. Will's Pink Eye*.

Introd. about 1945 by the now closed Oscar H. Will & Co., Bismarck, N. Dak. Reintrod. by Oscar H. Will & Co. as *M. cv. Diamond Jubilee* in 1956 in honor of their 75th anniversary. Name refers to a pale pinkish white area in center of the flowers.

Description: Flowers; single, expanding buds pinkish red, open pinkish white and white. Fruit; red, approx. 2 cm. in diam.

Location: (P).

cv. Pink Giant*

A selection of unknown parentage, probably *M. baccata* X *M. pumila* var. *niedzwetzkyana* (67).

Introd. by Carl A. Hansen, Hansen Nursery, Brookings, S. Dak. Offered for the first time in Carl A. Hansen, Spring Catalogue, 1939.

Description: Flowers; single, expanding buds rose pink, open pale pink to pale lavender, approx. 5 cm. across. Fruit; orange, orange red to red on exposed side, approx. 2 cm. in diam.

Location: (O).

cv. Pioneer Scarlet*

A seedling of unknown parentage.

Introd. before 1954 by A. L. Young, Bonnie Brooks Farms, Brooks, Alberta, Canada.

Location: (I).

cv. Pixie*

M. floribunda

M. prunifolia

cv. *Pendula*

cv. *Exzellenz Thiel**

M. pumila var.

niedzwetzkyana

cv. *Oekonomierat*
*Echtermeyer**

Unknown

= cv. *Pixie**

An open pollinated seedling. Originated at Des Moines Water Works, Des Moines, Iowa. Selected in 1940 and named by Arie F. den Boer. Introd. in 1948. Late flowering. Disease free (41).

Description: Flowers; single, pink, approx. 5 cm. across. Fruit; dark crimson to oxblood red, approx. 4.6 cm. in diam.

Location: (R).

cv. **Prairie Rose***

An open pollinated seedling of *M. ioensis*.

Introd. before 1959 by the Agr. Experimental Station, Univ. of Illinois, Urbana, Ill. Similar to but with deeper pink flowers than *M. ioensis* cv. Plena. Formerly OPS 825.

Description: Flowers; double, pink.

Location: (A).

cv. **Pretty Marjorie**

Originated in Holland. Introd. into U.S.A. by the Arnold Arboretum about 1958.

Locations: (C), (O).

cv. **Prince George's***

Probably *M. ioensis* cv. Plena X *M. angustifolia* (67). Syns: *M. angustifolia* cv. Plena; *M.* cv. Prince George; *M.* cv. Prince Georges.

Originated from open pollinated seed collected in 1919 at the Arnold Arboretum by a plant explorer for the U.S. Dept. of Agr. The original plant was grown at the Plant Introduction Station, Glenn Dale, Md. and scions were sent in 1930 to the Arnold Arboretum. Introd. in 1943 by the Arnold Arboretum. Named for Prince George's County, Maryland, the county in which the Glenn Dale Station is located.

Description: Flowers; double (approx. 53-61 petals), expanding buds deep rose pink, open light rose pink, approx. 5 cm. across. Not known to produce fruit.

Locations: (C), (T).

cv. **Printosh**

<i>M. baccata</i> —————] cv. Prince —————] = cv. Printosh
<i>M.</i> cv. Tetofsky (Apple) —————		
	cv. McIntosh (Apple)]	

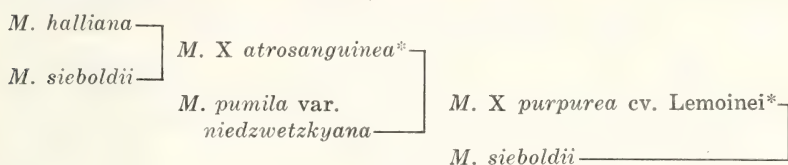
Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in

1905 by William Saunders. Named in 1920 for the first and last syllables, respectively, of each parent name.

Description: Flowers; single, expanding buds rose pink, open white with touch of pink on back of petals, approx. 4.2 cm. across. Fruit; pale orange and carmine, approx. 5 cm. in diam.

Location: (B).

cv. Profusion

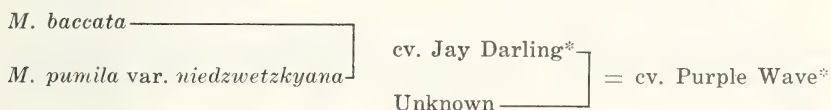


Originated from a cross made before 1938 by S. G. A. Doorenbos, Dept. of Parks, The Hague, Holland. Introd. by the originator. Name refers to the abundance of flowers.

Description: Flowers; single, expanding buds deep red, open purplish red fading to purplish pink, approx. 4 cm. across. Fruit; oxblood red, approx. 1.3 cm. in diam.

Location: (B).

cv. Purple Wave*



A chance seedling originating at the Des Moines Water Works, Des Moines, Iowa. Selected about 1940 by Arie den Boer. Named in 1951 by Inter-State Nurseries, Hamburg, Iowa. Introd. in 1953 by Inter-State Nurseries. The name refers to its dark purplish green foliage. Formerly Jay Darling Red Seedling #3.

Description: Flowers; single, occasionally semidouble (approx. 6-7 petals), expanding buds carmine, open rose red fading to purplish pink or lavender, approx. 4 cm. across. Fruit; dark purplish red, approx. 2.5 cm. in diam.

Locations: (A), (B), (C), (R).

cv. Quality*

Parentage unknown.

Introd. about 1906 by Boughen Nurseries, Valley River, Manitoba, Canada. Extremely hardy.

Location: (I).

cv. Radiant*

M. pumila var. *niedzwetzkyana* —————
M. baccata —————
cv. Hopa*
Unknown

= cv. Radiant*

A chance seedling, presumably *M. cv. Hopa** open pollinated (56). Selected about 1940 by the late L. E. Longley, Dept. of Horticultural Science, Univ. of Minnesota. Named in 1957 and introd. by the Univ. of Minnesota, St. Paul, Minn., in 1958. Formerly Minnesota 6C.

Description: Flowers; single, expanding buds deep red, open deep pink. Fruit; bright red, approx. 1.3 cm. in diam.

Locations: (A), (I), (P), (R), (S).

cv. Red Jade* (Plant Patent No. 1497)

M. floribunda —————
M. prunifolia cv. *Pendula* —————
cv. Exzellenz Thiel*
Unknown

= cv. Red Jade*

A selection by George M. Reed originating in 1935 at the Brooklyn Botanic Garden, Brooklyn, N.Y. Introd. in 1953 by the Brooklyn Botanic Garden. Plant patent granted July 17, 1956, assigned to the Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y. The name refers to the glossy red fruit. Noted for weeping habit and attractive fruit.

Description: Flowers; single, expanding buds deep pink, open white, approx. 4 cm. across. Fruit; glossy red, approx. 1.3 cm. in diam.

Locations: (C), (F), (J), (O), (S).

cv. Red Splendor*

M. baccata —————
M. pumila var. *niedzwetzkyana* —————
cv. Red Silver*
Unknown

= cv. Red Splendor*

Selected in 1948, from a row of 200 *M. cv. Red Silver** open pollinated seedlings, by Melvin Bergeson, Bergeson Nursery, Fertile, Minn. Disease free (41).

Description: Flowers; single, expanding buds rose red, open pink to rose pink, approx. 4.5 cm. across. Fruit; red, approx. 1.5 cm. in diam.

Location: (R).

cv. Red Tip

M. coronaria cv. *Elk River* X *M. pumila* var. *niedzwetzkyana*.

("den Boer doubts presence of *M. pumila* var. *niedzwetzkyana* in *M. cv. Red Tip*" (64).)

Introd. in 1919 by South Dakota Agricultural Experiment Station, Brookings, S. Dak. Originated from a cross made by Niels E. Hansen. Name refers to the red tip of the young leaves.

Description: Flowers; single, expanding buds rose pink to carmine, open pale rose pink, approx. 4.5 cm. across. Fruit; yellowish green, approx. 5 cm. in diam.

Location: (Q).

cv. Redflesh

M. pumila var. *niedzwetzkyana* X *M. coronaria* cv. Elk River.

Originated from a cross made by Niels E. Hansen. Introd. in 1928 by the South Dakota Agricultural Experiment Station, Brookings, S. Dak. Name refers to the red color of the crabapple flesh.

Description: Flowers; single, expanding buds carmine, open pale rose pink, approx. 4.5 cm. across. Fruit; red, shaded side greenish brown, approx. 4.7 cm. in diam.

Locations: (C), (I).

Progeny of *M. cv. Redflesh*:

M. cv. Cranberry (Wodarz)

M. cv. Redflesh Winter (Hansen, N. E.)

cv. Rescue*

An open pollinated seedling of *M. cv. Blushed Calville* (apple).

Named and introd. about 1936 by the Experimental Farm, Canada Dept. of Agr., Scott, Saskatchewan, Canada. Extremely hardy.

Description: Flowers; pink fading to white, approx. 2.5 cm. across. Fruit; red, approx. 3.5 cm. in diam.

Locations: (I), (Q).

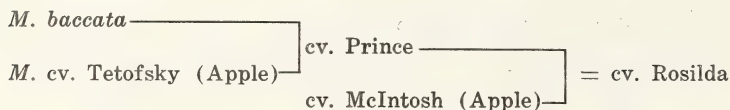
cv. Robin

M. baccata X *M. cv. (Simbirsk No. 9)* (apple).

Introd. by Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in 1904 by William Saunders, named in 1911.

Description: Flowers; single, expanding buds rose red, open white with trace of pink along edges, petals cupped, approx. 4 cm. across. Fruit; orange yellow with pale red blush, evenly ribbed, approx. 4 cm. in diam.

Locations: (C), (I).

cv. Rosilda

Originated from a cross made in 1905 by William Saunders. Named and introd. in 1920 by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada.

Description: Flowers; single, pink fading to white. Fruit; greenish yellow and red, approx. 4.8 cm. in diam.

Locations: (C), (I).

Progeny of *M. cv. Rosilda*:

*M. cv. Altagold** (Salamandyck)

M. cv. Toba (C.D.A., Morden)

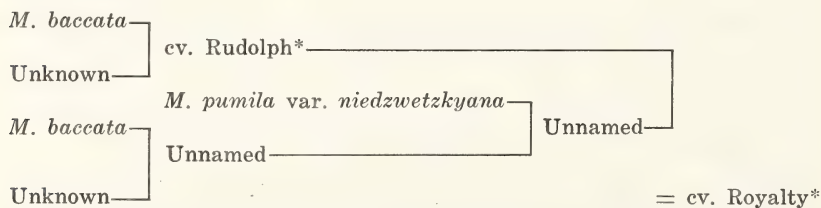
cv. Rosseau*

An open pollinated seedling of *Malus pumila* var. *niedzwetzkyana*

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Rosseau Lake in southern Ontario, Canada.

Description: Flowers; single, expanding buds maroon red, open purplish to rose red with white claw, approx. 4 cm. across. Fruit; carmine to light jasper red, approx. 2.5 cm. in diam.

Locations: (C), (H), (I), (M).

cv. Royalty*

A red leaf selection made in 1958 by W. L. Kerr, Sutherland, Saskatchewan, Canada. Mr. Kerr selected cv. Royalty* from a large number of open pollinated Rosybloom seedlings he found growing in Sutherland. Since *M. cv. Rudolph** bloomed near the seedlings, Kerr suspected it to be the pollen parent. Named and introd. by Kerr in 1962. Formerly Sutherland #2.

Description: Flowers; single, crimson, almost purple. Fruit; dark red, approx. 1.5 cm. in diam.

Location: (H).

cv. Rudolph*

Parentage unknown, possibly a *M. baccata* hybrid.

Introd. in 1954 by F. L. Skinner, Dropmore, Manitoba, Canada. Extremely hardy. Similar to *M. cv. Almey* but hardier (67).

Description: Flowers; single, expanding buds carmine, open pink, approx. 5 cm. across.

Locations: (C), (H), (I), (O), (Q).

Progeny of *M. cv. Rudolph**:

*M. cv. Royalty** (Kerr)

cv. Scugog*

An open pollinated seedling of *M. pumila* var. *niedzwetzkyana*.

Originated in 1920 and introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Selected by Miss Isabella Preston and named in 1930 for Scugog Lake in southeastern Ontario, Canada.

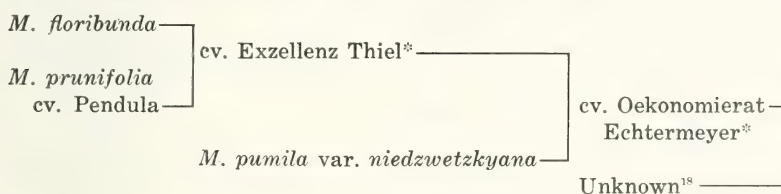
Description. Flowers; single, expanding buds dark purplish red, open purplish red with white claw, approx. 4.5 cm. across. Fruit; dark crimson to oxblood red, approx. 4.5 cm. in diam.

Locations: (A), (I), (Q).

Progeny of *M. cv. Scugog**:

*M. cv. Oakes** (Oakes)

cv. Seafoam*



An open pollinated seedling selected in 1940 by Arie den Boer, Des Moines Water Works, Des Moines, Iowa. Named in 1952 and introd. by Arie den Boer. A selection with semipendulous branches and deeply lobed green leaves. Formerly Oekonomierat Echtermeyer seedling No. 1. Disease free (41).

Description: Flowers; single, expanding buds rose pink to carmine, open white with trace of pink to flushed with a deeper pink, approx. 3.5 cm. across. Fruit; yellow, approx. 1.3 cm. in diam.

¹⁸ den Boer (21, p. 59) refers to Toringo Crab (*M. sieboldii*) as an ancestor of *M. cv. Seafoam**.

Locations: (A), (E), (P).

cv. Selkirk

M. baccata X *M. pumila* var. *niedzwetzkyana*.

Introd. by the Experimental Farm, Canada Dept. of Agr., Morden, Manitoba, Canada. Formerly MR 457.

Description: Flowers; rose red. Fruit; glossy purplish red, approx. 2 cm. in diam. Effective in color throughout most of summer.

Locations: (H), (M), (O), (Q), (T).

cv. Shakespeare

Introd. by E. H. Scanlon and Associates, Olmsted Falls, Ohio. *M. cv. Shakespeare* at the U.S. National Arboretum, although grafted on a high standard, is similar in every aspect to *M. X atrosanguinea** (Author).

A selection *M. X atrosanguinea** discovered by E. H. Scanlon in The Shakespeare Cultural Garden, Cleveland, Ohio.

Locations: (C), (E).

cv. Simcoe

M. baccata X *M. pumila* var. *niedzwetzkyana*.

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated in 1920 from a cross made by Miss Isabella Preston. Named in 1930 for Simcoe Lake, 40 miles north of Toronto, Canada.

Description: Flowers; single, expanding buds dark red, open light purplish red, approx. 4.5 cm. across. Fruit; carmine and orange, approx. 2.5 cm. in diam.

Locations: (A), (H), (I).

Progeny of *M. cv. Simcoe*:

M. cv. Baskatong (C.D.A., Ottawa)

cv. Sissipuk

M. pumila var. *niedzwetzkyana* X *M. baccata*.

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated in 1920 from a cross made by Miss Isabella Preston. Named in 1930 for Sissipuk Lake in British Columbia.

Description: Flowers; single, expanding buds deep carmine, open rose pink fading to pale pink. Fruit; dark maroon purple to oxblood red, approx. 2.7 cm. in diam.

Locations: (A), (B), (D), (H), (I), (P).

cv. Snowbank*

An open pollinated seedling of *Malus floribunda*.

Introd. in 1934 by Kelsey-Highlands Nursery, East Boxford, Mass.

Description: Flowers; single, expanding buds pink, open white, approx. 3 cm. across. Fruit; yellow, approx. 1 cm. in diam.

Locations: (C), (O).

cv. Snowcap*

A *M. baccata* seedling.

Introd. and named in 1952 by the Research Station, Research Branch, Canada Dept. of Agr., Beaverlodge, Alberta, Canada. Received by introducer from Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada, in 1941. Extremely hardy. Disease free (41).

Description: Flowers; single, expanding buds tinged with pink, open white, approx. 6 cm. across. Fruit; bright red, approx. 1 cm. in diam.

Locations: (H), (I).

cv. Snowdrift*

A chance seedling of unknown parentage.

Named and introd. about 1965 by the Cole Nursery Co., Painesville, Ohio.

Description: Flowers; single, expanding buds red, open white. Fruit; orange red, approx. 1 cm. in diam.

Locations: (D), (E), (O).

cv. Striped Beauty*

Parentage unknown.

Introd. into U.S.A. in 1930 by the U.S. Dept. of Agr., Plant Introduction Station, Glenn Dale, Md. (U.S.D.A. Plant Introduction No. 88577), through accessions received from the original introducer, Hayward R. Wright, Avondale, Auckland, New Zealand. Name refers to the fruit, which is said to be striped.

Description: Flowers; single, expanding buds pink, open white, approx. 2.5 cm. across. Fruit; red and yellow, approx. 2.5 cm. in diam.

Locations: (C), (P).

cv. Sundog

A second generation (F₂) hybrid of *M. baccata* X *M. pumila* var. *niedzwetzkyana*.

Introd. and named in 1947 by the Experimental Farm, Research Branch, Canada Dept. of Agr., Morden, Manitoba, Canada. The name refers to the parhelions commonly called "Sundogs" which are colored refractions of sunlight observed in Arctic regions. Formerly Morden 453.

Description: Flowers; single, expanding buds rose red, open pink fading to pinkish white with mauve shading. Fruit; deep scarlet red, approx. 2.5 cm. in diam. Tree very upright in habit when young, becoming wide vase shaped with age.

Locations: (A), (C), (H), (I), (P), (Q), (R).

cv. Timiskaming

M. pumila var. *niedzwetzkyana* X *M. baccata*.

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated in 1920 from a cross made by Miss Isabella Preston. Named in 1930 for Timiskaming Lake in southwestern Quebec, Canada.

Description: Flowers; single, expanding buds deep carmine to deep maroon red, open rose red with white star at base of petals fading to purplish pink, approx. 4.5 cm. across. Fruit; dark purplish red, approx. 2.3 cm. in diam.

Locations: (B), (D), (H), (I), (Q).

cv. Tolsteme*

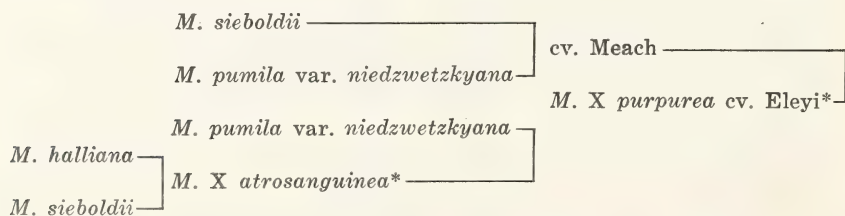
A *M. baccata* seedling of unknown origin given to Niels E. Hansen in 1934 by Ivan Mitchurin of Russia.

Introd. in 1942 by the South Dakota Agricultural Experiment Station, Brookings, S. Dak. Bears fruit freely when only 5 feet high.

Description: Flowers; single, expanding buds rose pink, open white, approx. 3.5 cm. across. Fruit; dark red to oxblood red, orange red on shaded side, approx. 3 cm. in diam.

Location: (B).

cv. Tomiko



(F₂) = cv. Tomiko

A second generation (F_2) hybrid which originated at the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada, before 1953. Named for Tomiko Lake in the Nipissing area of Ontario, Canada. The purplish foliage is maintained throughout summer.

Description: Flowers; single, expanding buds dark maroon to dark reddish purple, open reddish purple, approx. 4.5 cm. across.

Locations: (B), (H), (I), (L).

cv. Van Eseltine

M. baccata —
M. floribunda — } *M. X arnoldiana**
 M. spectabilis — } = cv. Van Eseltine

Originated at the New York Agr. Experiment Station, Geneva, from a cross made by Glen P. Van Eseltine in 1930. Named in honor of originator after his death, and introd. in 1941. Syns: *M. cv. Geneva* (not Preston); *M. cv. Van Esseltine*.

Description: Flowers; double (13–19 petals), expanding buds deep rose red to rose pink, open pink fading to pale pink, approx. 5 cm. across. Fruit; yellow, with brown or light carmine cheek, approx. 1.8 cm. in diam.

Location: (O).

cv. Van Houttei*

Parentage unknown, originated in a Dutch nursery.

Introd. by R. C. Notcutt, Ltd., Woodbridge, Suffolk, England. No longer carried by introducer since yellow-fruited *M. cv. Golden Hornet* is more popular for small gardens.

Description: Flowers; single, white. Fruit; pale yellow turning deeper yellow with age.

Location: (O).

cv. Vanguard*

M. pumila var. *niedzwetzkyana* —
M. baccata — } cv. Hopa*
 Unknown — } = cv. Vanguard*

A chance seedling originating at the Univ. of Minnesota State Fruit Farm, Excelsior, Minn. Selected by L. E. Longley about 1940. Named and introd. in 1963 by the Dept. of Horticultural Science, Univ. of Minnesota, St. Paul. Formerly Minnesota 11AA.

Description: Flowers; single, rose pink, approx. 5 cm. across. Fruit; red, approx. 2 cm. in diam.

Locations: (P), (R).

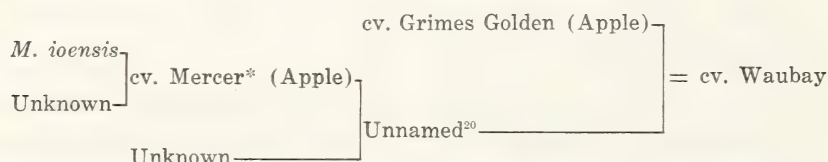
cv. Wabiskaw

M. pumila var. *niedzwetzkyana* X *M. baccata*.¹⁹

Introd. by the Central Experimental Farm, Canada Dept. of Agr., Ottawa, Ontario, Canada. Originated from a cross made in 1920 by Miss Isabella Preston. Named in 1930.

Description: Flowers; single, expanding buds deep rose red, open purplish red with pale purplish center, approx. 4.5 cm. across. Fruit; carmine red, yellowish to greenish brown on shaded side, approx. 3 cm. in diam.

Locations: (A), (C), (O), (P).

cv. Waubay

Originated from a cross made by Niels E. Hansen. Introd. in 1933 by South Dakota Agricultural Experiment Station, Brookings, S. Dak.

Description: Fruit; red, approx. 3.5 cm. in diam.

Location: (Q).

cv. White Angel*

A chance seedling of unknown parentage. Originated at Inglis Nursery about 1947.

Introd. in 1962 by Beno's Nursery, Youngstown, Ohio.

Description: Flowers; single, white, approx. 2.6 cm. across. Fruit; scarlet red, approx. 1.5 cm. in diam.

Locations: (D), (E), (N).

cv. William Anderson*

Origin and parentage unknown.

Introd. before 1931 by William Sim Nursery, Cliftondale, Mass. Named for caretaker of Massachusetts estate of Mrs. Bayard Thayer.

¹⁹ See footnote 16, p. 48.

²⁰ Open-pollinated seedling of the Mercer (apple) from the Iowa Experiment Station, possibly a hybrid of *M. cv. Wolf River* (apple).

Description: Flowers; single, expanding buds rose red, open light pink or pinkish white flushed with rose red, approx. 3.5 cm. across. Fruit; green and red, approx. 1.8 cm. in diam.

Location: (C).

cv. William Sim*

Origin and parentage unknown.

Introd. before 1931 by William Sim Nursery, Cliftondale, Mass.

Description: Flowers; single, expanding buds carmine, open pale pink, back of petals flushed with deeper pink, approx. 5.5 cm. across. Fruit; carmine, yellow to greenish yellow on shaded side, more or less angular, approx. 2.8 cm. in diam.

Location: (C).

cv. Winter Gold*

A seedling selection of possibly *M. sieboldii* var. *zumi* made before 1947 by S. G. A. Doorenbos, Dept. of Parks, The Hague, Holland.

Introd. by S. G. A. Doorenbos.

Description: Flowers; single, expanding buds deep carmine, open white, approx. 3 cm. across. Fruit; yellow, occasionally with orange to pink blush, approx. 1.2 cm. in diam.

Location: (B).

cv. Zita

M. pumila var. *niedzwetzkyana* X *M.* cv. Yellow Siberian.²¹

Originated from a cross made by Niels E. Hansen. Introd. in 1933 by South Dakota Agricultural Experiment Station, Brookings.

Description: Flowers; single, expanding buds deep purplish red, open purplish pink to pale orchid pink, approx. 4.5 cm. across. Fruit; dark crimson to light red and yellow, approx. 4.5 cm. in diam.

Location: (B).

²¹ A note from Ronald M. Peterson, South Dakota State University, Brookings, S. Dak., to author concerning this name, "I believe this is *M. baccata* cv. Yellow Siberian. Actually it was probably intended to refer to a pure *M. baccata* seedling. In a leaflet printed February 15, 1933, Dr. Hansen refers to this parent as Yellow Siberian Crab."

Part II:

Genealogical Schemes Showing Probable Parental Relationships for Previously Cited Progeny

Section A:

Species

M. baccata —
M. floribunda —] = *M. X arnoldiana** (Rehd.) Rehd.

M. halliana —
M. baccata —] = *M. X hartwiggi** Koehne

M. baccata —
M. spectabilis —] = *M. X micromalus**²² Makino

Section B:

Cultivars ²³

M. baccata —
Unknown —] = cv. Adam* (Boughen)

M. baccata —
M. cv. Haas (Apple) —] = cv. Alberta (C.D.A., Ottawa)

M. pumila var. *niedzwetzkyana* —
Unknown —] *M. baccata* —
Rosybloom —]
= cv. Albright* (C.D.A., Alberta)

M. baccata —
M. prunifolia —] *M. X robusta** —
Unknown —] = cv. Alexis* (Hansen, N. E.)

M. baccata —
M. pumila var. *niedzwetzkyana* —] (F₂) = cv. Almey (C.D.A., Morden)

²² See footnote 4, p. 9.

²³ See footnote 10, p. 24.

M. pumila var. *niedzwetzkyana* —————
M. baccata ————— } cv. Hopa*
 Unknown ————— } = cv. Alred* (P.H.S., Brooks)

M. baccata —————
M. cv. Tetofsky (Apple) ————— } cv. Prince —————
M. cv. McIntosh (Apple) ————— } cv. Rosilda
 Unknown ————— }
 = cv. Altagold* (Salamandyck)

M. ioensis (possibly a hybrid) —————
M. baccata ————— } = cv. Amsib (Hansen, N. E.)

M. baccata —————
M. prunifolia ————— } *M. X robusta**
 Unknown ————— } = cv. Amur* (Hansen, N. E.)

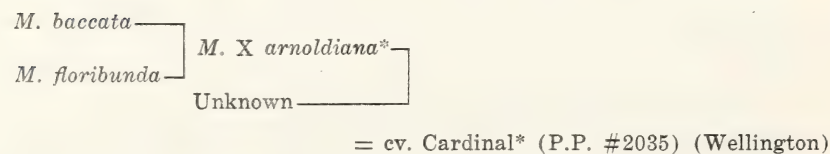
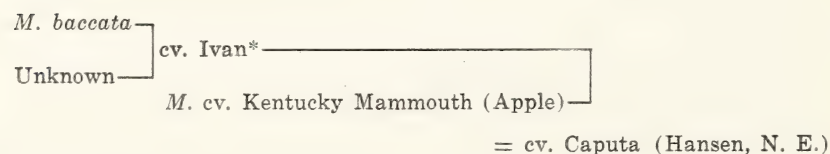
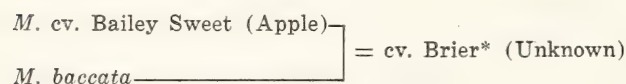
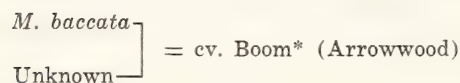
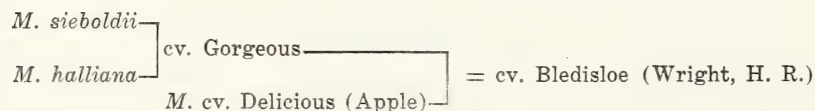
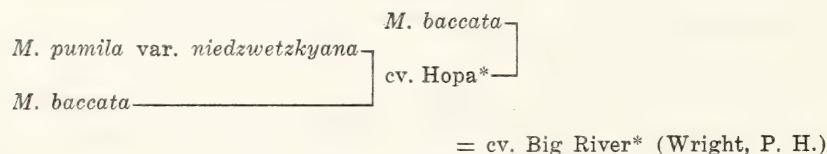
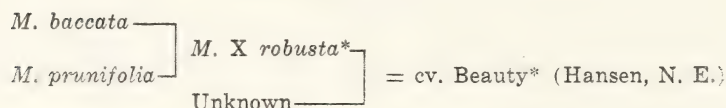
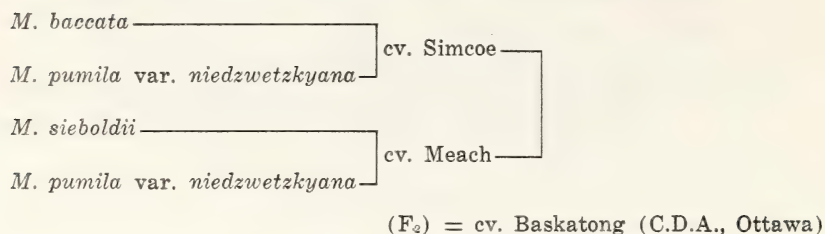
M. cv. Alexander (Apple) —————
 Unknown ————— } *M. baccata* —————
 cv. McMahon (Apple) ————— } cv. Tony —————
M. ioensis —————
 Unknown ————— } cv. Mercer* (Apple) —————
 = cv. Ann Trio (Hansen, N. E.)

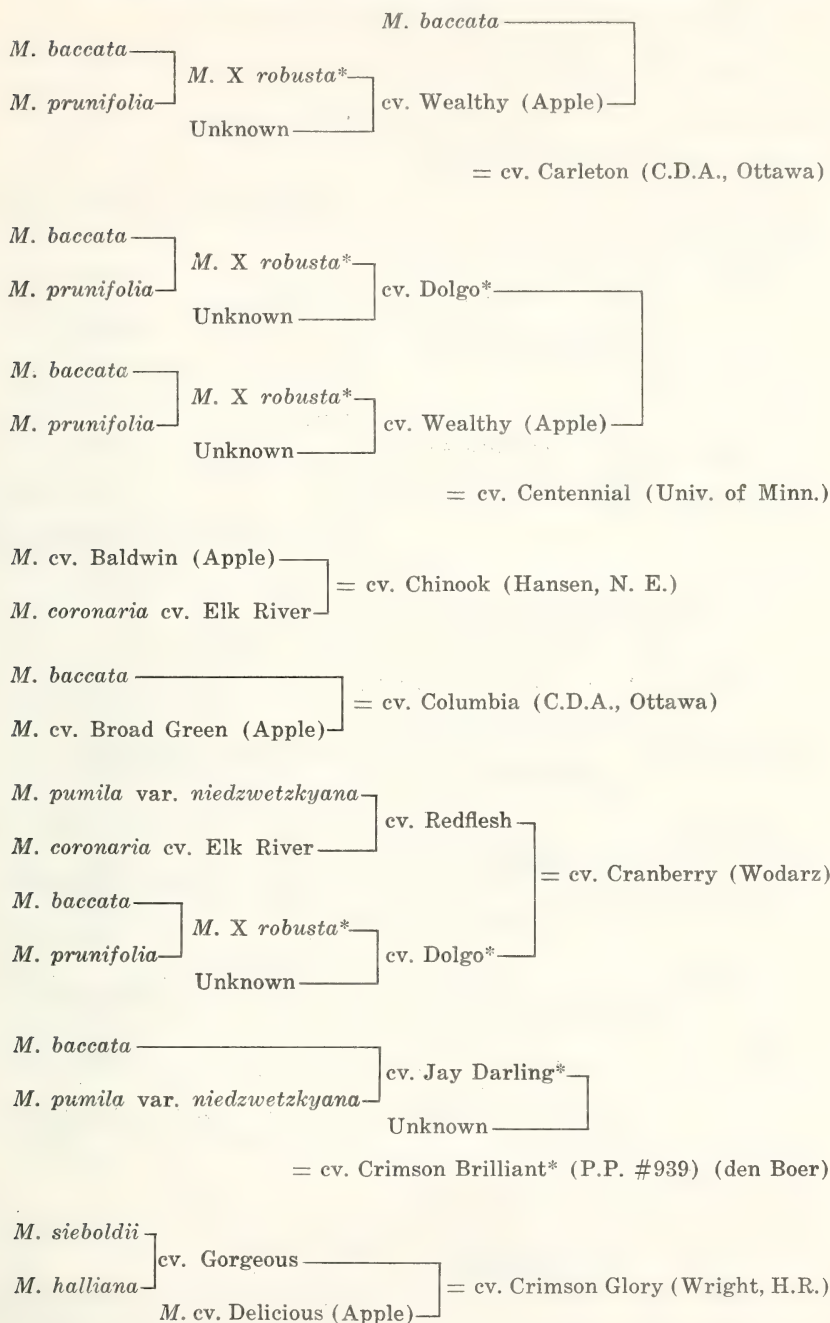
M. pumila var. *niedzwetzkyana* —————
 Unknown (Possibly *M. baccata*) ————— } = cv. Arctic Dawn* (C.D.A., Alberta)

M. pumila var. *niedzwetzkyana* —————
M. baccata ————— } = cv. Athabasca (C.D.A., Ottawa)

M. pumila var. *niedzwetzkyana* —————
M. baccata ————— } = cv. Babine (C.D.A., Ottawa)

M. baccata —————
M. floribunda ————— } *M. X arnoldiana** —————
M. halliana cv. *Parkmanii* ————— } cv. Dorothea*
 Unknown ————— }
 = cv. Barbara Ann* (Wyman)





M. baccata —
Unknown — } = cv. Currant²⁴

M. baccata —
M. prunifolia — } *M. X robusta** —
M. ioensis — } cv. Mercer* (Apple) —
Unknown — } = cv. Dan Trio (Hansen, N. E.)

M. pumila var. *niedzwetzkyana* —
Unknown — } = cv. Dauphin* (C.D.A., Ottawa)

M. floribunda —
M. prunifolia — } *M. X scheideckeri* —
M. baccata — } *M. X micromalus**²⁵ —
M. spectabilis — } = cv. David Nairn (Wright, H. R.)

M. baccata —
M. prunifolia — } *M. X robusta** —
Unknown — } = cv. Dolgo* (Hansen, N. E.)

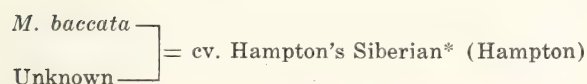
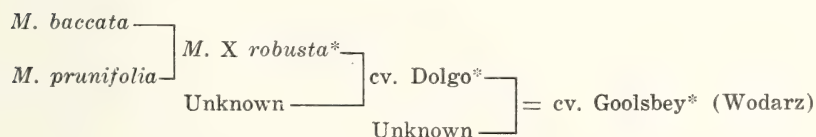
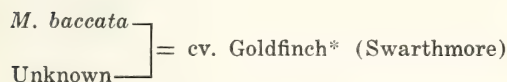
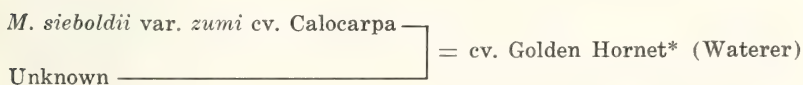
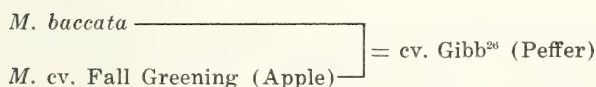
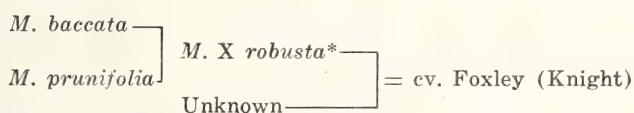
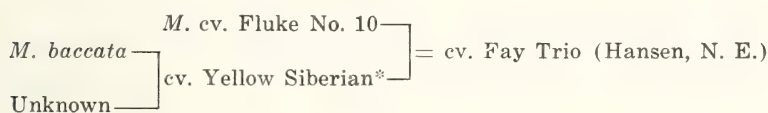
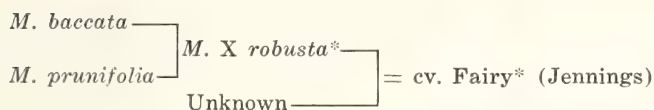
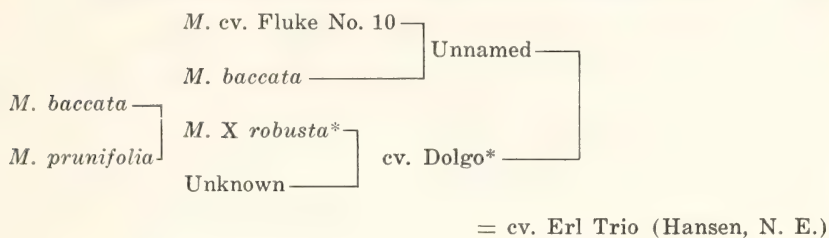
M. baccata —
M. floribunda — } *M. X arnoldiana** —
M. halliana cv. *Parkmanii* — } = cv. Dorothea* (Wyman)

M. baccata —
M. cv. Yellow Transparent (Apple) — } = cv. Elsa (C.D.A., Ottawa)

M. sieboldii —
M. halliana — } cv. Gorgeous —
*M. cv. John Downie** — } cv. Jack Humm —
M. baccata — } *M. X robusta** —
M. prunifolia — } = cv. Elsie Burgess (Wright, H. R.)

²⁴ Origin unknown; first described by Charles Downing in 1857.

²⁵ See footnote 4, p. 9.



²⁰Wyman, Donald (67, p. 33) lists cv. Gibb as *M. baccata* X *M. cv. Fall Greening*; however, Beach, S. A., Booth, N. O., and Taylor, O. M. (2, v. 2, p. 256) list cv. Gibb as *M. cv. Yellow Siberian* X *M. cv. Fall Greening*.

M. baccata — *M. cv. Fluke No. 29* —
 Unknown — *cv. Yellow Siberian** — = *cv. Hans Trio (Hansen, N. E.)*

M. baccata —
M. prunifolia — *M. X robusta** — *cv. Dolgo** —
 Unknown — *M. cv. Oldenburg (Apple)* —
 = *cv. Heart River (Baird)*

M. baccata —
M. pumila var. niedzwetzkyana — *cv. Jay Darling** —
 Unknown —
 = *cv. Helen* (den Boer)*

M. baccata —
M. floribunda — *M. X arnoldiana** —
M. pumila var. niedzwetzkyana —
 = *cv. Henrietta Crosby (Sax)*

See the genealogical scheme for *cv. Henry F. DuPont** on facing page.

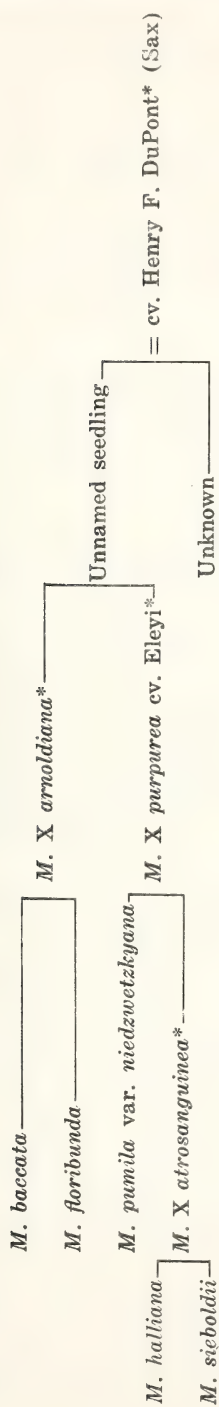
M. pumila var. niedzwetzkyana —
M. baccata — = *cv. Hopa* (Hansen, N. E.)*

M. pumila var. niedzwetzkyana —
M. baccata — = *cv. Huron (C.D.A., Ottawa)*

M. baccata —
M. pumila var. niedzwetzkyana — *cv. Jay Darling** —
 Unknown —
 = *cv. Irene* (den Boer)*

M. baccata —
 Unknown — = *cv. Ivan* (Hansen, N. E.)*

M. sieboldii —
M. halliana — *cv. Gorgeous* —
*M. cv. John Downie** — = *cv. Jack Humm (Nairn)*



- M. cv. Blushed Calville (Apple)* —
 Unknown — = *cv. Jacques (C.D.A., Rosthern)*
- M. baccata* —
M. pumila var. niedzwetzkyana — = *cv. Jay Darling* (den Boer)*
- M. baccata* —
M. cv. Yellow Transparent (Apple) — = *cv. Jewell (C.D.A., Ottawa)*
- M. baccata* —
M. prunifolia — *M. X robusta** —
 Unknown — = *cv. Joan* (Dunbar)*
- M. baccata* —
M. prunifolia — *M. X robusta** —
M. ioensis — *cv. Mercer* (Apple)* —
 Unknown — = *cv. Joe Trio (Hansen, N. E.)*
- M. pumila var. niedzwetzkyana* —
M. baccata — *cv. Hopa** —
 Unknown — = *cv. Jubilee* (P.H.S., Brooks)*
- M. halliana* —
M. baccata — = *cv. Katherine* (Slavin)*
- M. baccata* —
M. prunifolia — *M. X robusta** —
 Unknown — *cv. Amur** —
 Unknown — = *cv. Keo* (Hansen, N. E.)*
- M. baccata* —
M. prunifolia — *M. X robusta** —
 Unknown — *cv. Dolgo** —
M. cv. Malinda (Apple) —
 Unknown — *cv. Haralson (Apple)* —
 = *cv. Kerr (C.D.A., Morden)*

M. coronaria cv. Elk River } = cv. Kola (Hansen, N. E.)
M. cv. Oldenburg (Apple) }

M. baccata } = cv. Lady Northcliffe* (Aldenham)
Unknown— }

M. cv. Hamilton Morning Star (Apple)
M. baccata _____] = *cv. Lee Trio (Hansen, N. E.)*

M. baccata —
M. floribunda —] *M.* X *arnoldiana** = cv. Linda* (den Boer)
Unknown —]

M. halliana
M. sieboldii

*M. X atrosanguinea**
M. pumila var.
niedzwetzkyana

M. X purpurea
 cv. Lemoinei*
M. sieboldii

= cv. Liset
 (Doorenbos)

M. baccata —
Unknown —] = cv. Martha* (Gideon)

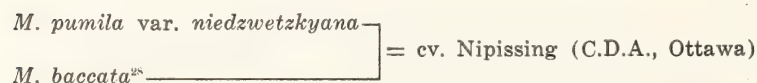
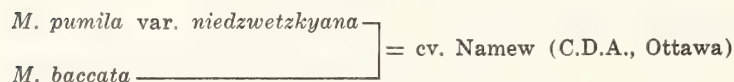
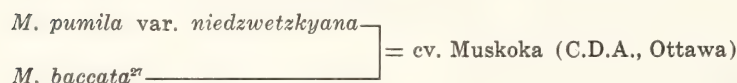
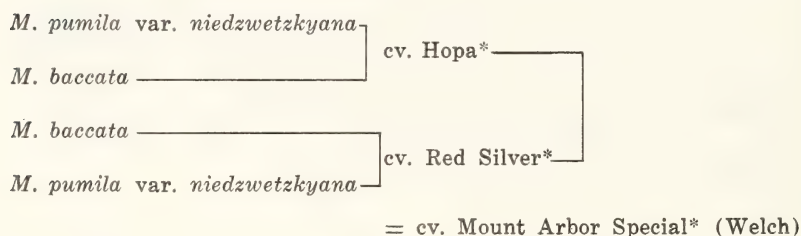
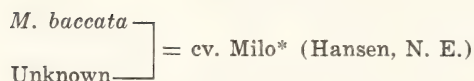
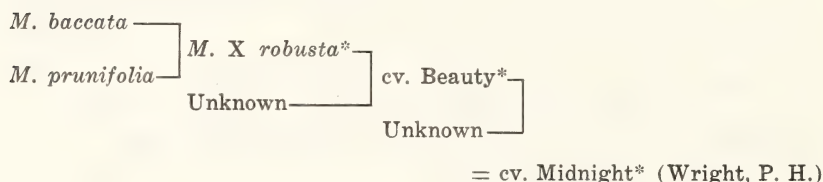
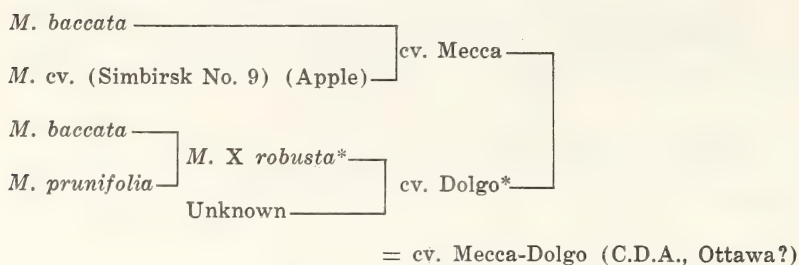
Phylogenetic tree showing relationships between *M. baccata*, *M. X robusta*, *M. prunifolia*, and their cultivars cv. Martha and cv. Dolgo. The tree indicates that cv. Martha is a cultivar of *M. baccata*, and cv. Dolgo is a cultivar of *M. X robusta*. The tree also shows that *M. baccata* and *M. X robusta* are sister taxa, and *M. prunifolia* is sister to the *M. baccata* clade. The tree is rooted at the bottom with the label "= cv. Martha-Dolgo (C.D.A., Morden)".

```

graph TD
    A["= cv. Martha-Dolgo (C.D.A., Morden)"] --- B
    B --- C["Unknown"]
    B --- D["M. X robusta*"]
    C --- E["cv. Dolgo*"]
    C --- F["M. baccata"]
    F --- G["Unknown"]
    F --- H["M. baccata"]
    H --- I["cv. Martha*"]
  
```

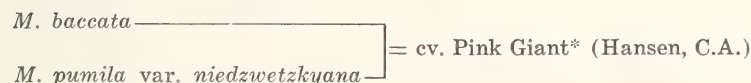
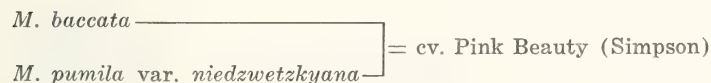
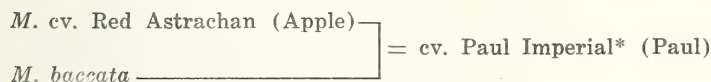
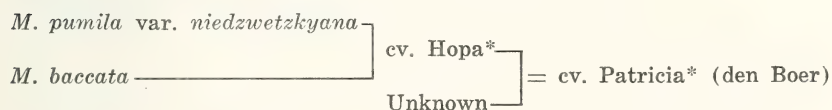
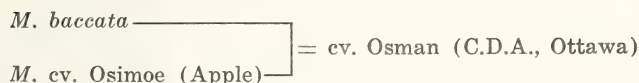
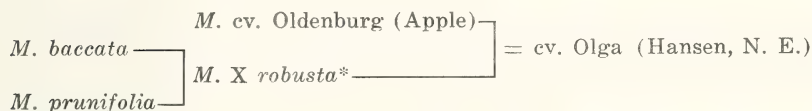
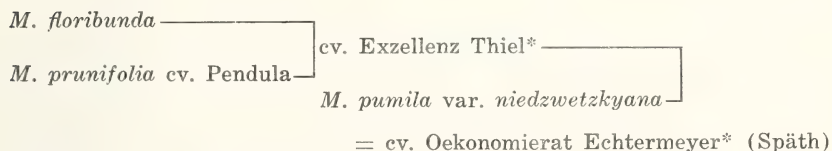
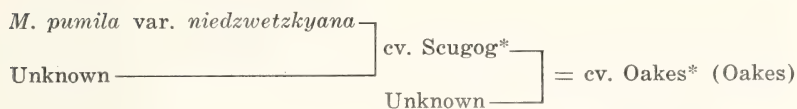
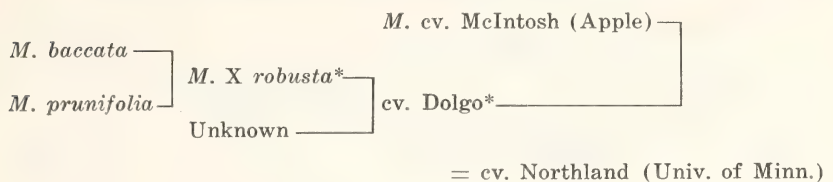
M. halliana — *M. sargentii* cv. Rosea
M. sieboldii — *M. X atrosanguinea** } = cv. Mary Potter (Sax)

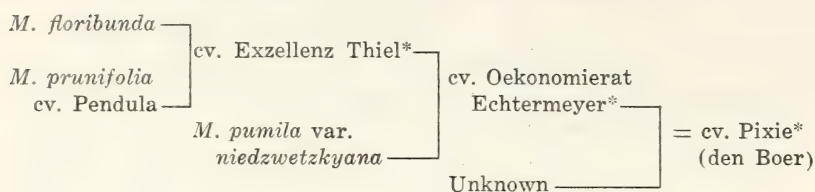
M. baccata —————
M. cv. (Simbirsk No. 9) (Apple) —————
 = *cv.* Mecca (C.D.A., Ottawa)



²⁷ See footnote 16, p. 48.

²⁸ See footnote 16, p. 48.





M. floribunda —————
M. prunifolia cv. *Pendula* —————
 cv. *Exzellenz Thiel** —————
 Unknown —————
 = cv. *Red Jade** (P.P. #1497) (Reed)

M. baccata —————
M. prunifolia —————
*M. X robusta** —————
 Unknown —————
 cv. *Dolgo** —————
M. cv. Delicious (Apple) —————
 = cv. *Red River* (Yeager)

M. baccata —————
M. pumila var. *niedzwetzkyana* —————
 = cv. *Red Silver** (Hansen, C.A.)

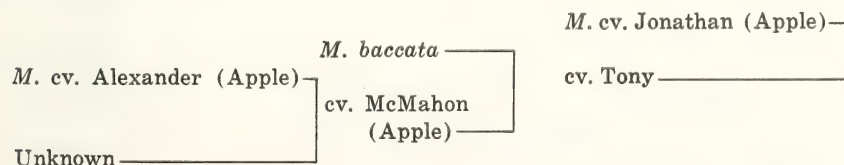
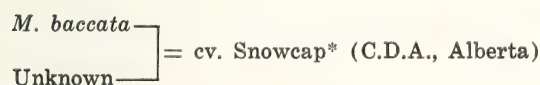
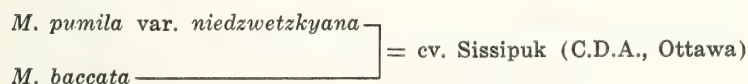
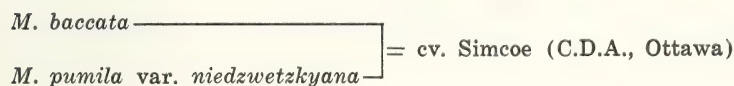
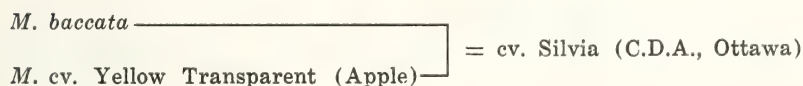
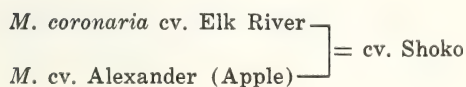
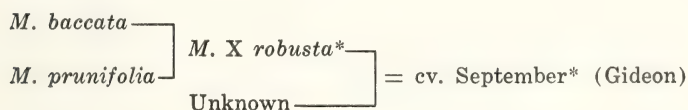
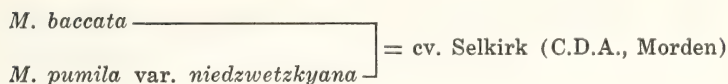
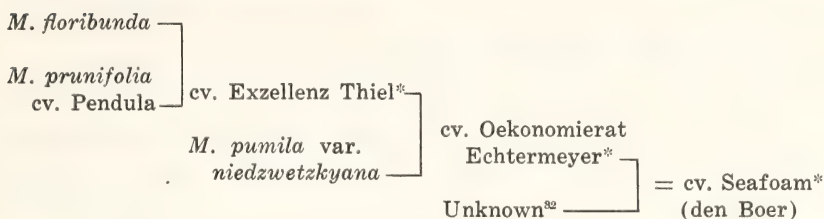
M. baccata —————
M. pumila var. *niedzwetzkyana* —————
 cv. *Red Silver** —————
 Unknown —————
 = cv. *Red Splendor** (Bergeson)

M. coronaria cv. *Elk River* —————
M. pumila var. *niedzwetzkyana* —————
 = cv. *Red Tip**²⁹ (Hansen, N.E.)

M. pumila var. *niedzwetzkyana* —————
M. coronaria cv. *Elk River* —————
 = cv. *Redflesh* (Hansen, N. E.)

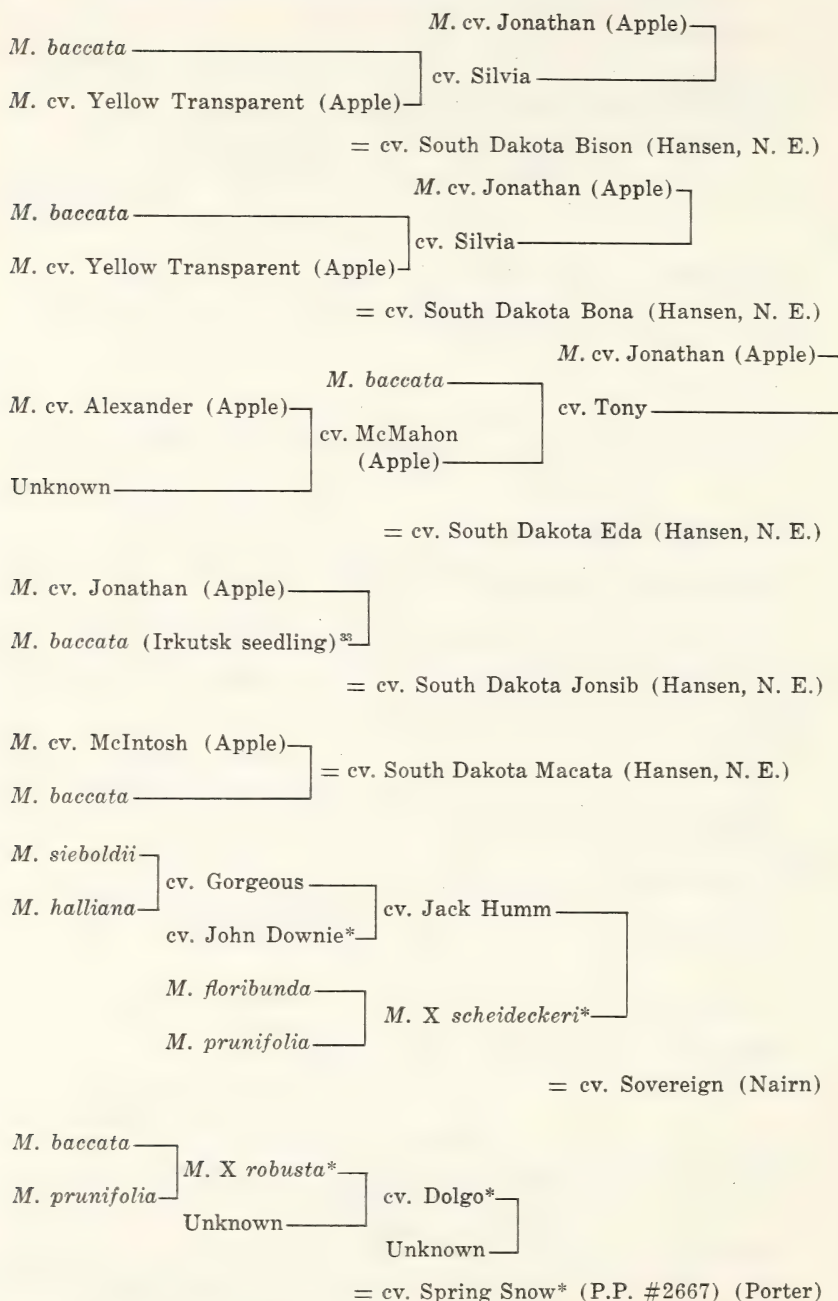
M. baccata —————
 Unknown —————
 cv. *Saska** —————
M. pumila var. *niedzwetzkyana* —————
M. coronaria cv. *Elk River* —————
 cv. *Redflesh* —————
 = cv. *Redflesh Winter* (Hansen, N. E.)

²⁹ Wister, John (64, p. 120) states that den Boer doubts presence of *M. pumila* var. *niedzwetzkyana* in *M. cv. Red Tip*.



= cv. South Dakota Ben (Hansen, N. E.)

⁸² See footnote 18, p. 57.



³³ Raised from seed of authentic origin obtained by N. E. Hansen from *M. baccata* tree growing wild near Irkutsk, Lake Baikal Region, eastern Siberia.

M. baccata —————
M. pumila var. *niedzwetzkyana* ————— (F₂) = cv. Sundog (C.D.A., Morden)

M. baccata —
Unknown — } = cv. Tanner* (Tanner)

M. pumila var. *medziewetzkiana*
M. baccata _____] = cv. Timiskaming (C.D.A., Ottawa)

M. coronaria cv. Elk River } = cv. Tipi (Hansen, N. E.)
M. cv. Oldenburg (Apple) }

```

graph LR
    Mb[M. baccata] --- J1(( ))
    Mct["M. cv. Tetofsky (Apple)"] --- J1
    J1 --- P["cv. Prince"]
    P --- J2(( ))
    Mci["M. cv. McIntosh (Apple)"] --- J2
    J2 --- R["cv. Rosilda"]
    R --- A["M. cv. Angus (Apple)"]
    A --- T["= cv. Toba (C.D.A., Morden)"]

```

M. baccata }
Unknown } = cv. Tolsteme* (Hansen, N. E.)

M. sieboldii —————
M. pumila var. *niedzwetzkyana* —————
M. pumila var. *niedzwetzkyana* —————
M. halliana —————
M. sieboldii —————
*M. X atrosanguinea** —————
M. X purpurea cv. *Eleyi** —————
(F₂) = cv. Tomiko (C.D.A., Ottawa)

M. baccata —————
M. cv. Tetofsky (Apple) ————
 cv. Prince —————
M. cv. McIntosh (Apple) ————
 = cv. Toshprince (C.D.A., Ottawa)

M. baccata }
Unknown } = cv. University* (Brand)

M. baccata ————
M. floribunda ————
 *M. X arnoldiana** ————
 M. spectabilis ————

= cv. Van Eseltine (N.Y. Expt. Sta.)

M. pumila var. *niedzwetzkyana* ————
M. baccata ————

cv. Hopa*

Unknown ————

= cv. Vanguard* (Univ. of Minn.)

M. pumila var. *niedzwetzkyana* ————
*M. baccata*³⁴ ————

= cv. Wabiskaw (C.D.A., Ottawa)

M. ioensis cv. Nevis ————
M cv. Northern Spy (Apple) ————

= cv. Wakonda (Hansen, N. E.)

M. coronaria cv. Elk River ————
M cv. Jonathan (Apple) ————

= cv. Wamdesa (Hansen, N. E.)

M. ioensis cv. Nevis ————
M cv. Northwestern Greening (Apple) ————

= cv. Wecota (Hansen, N. E.)

M. ioensis cv. Nevis ————
M cv. Wolf River (Apple) ————

= cv. Wetonka (Hansen, N. E.)

M. pumila var. *niedzwetzkyana* ————
M. baccata ————

M. baccata ————

cv. Hopa* ————

= cv. White Fox River* (Wright, P. H.)

M. baccata ————
 Unknown ————

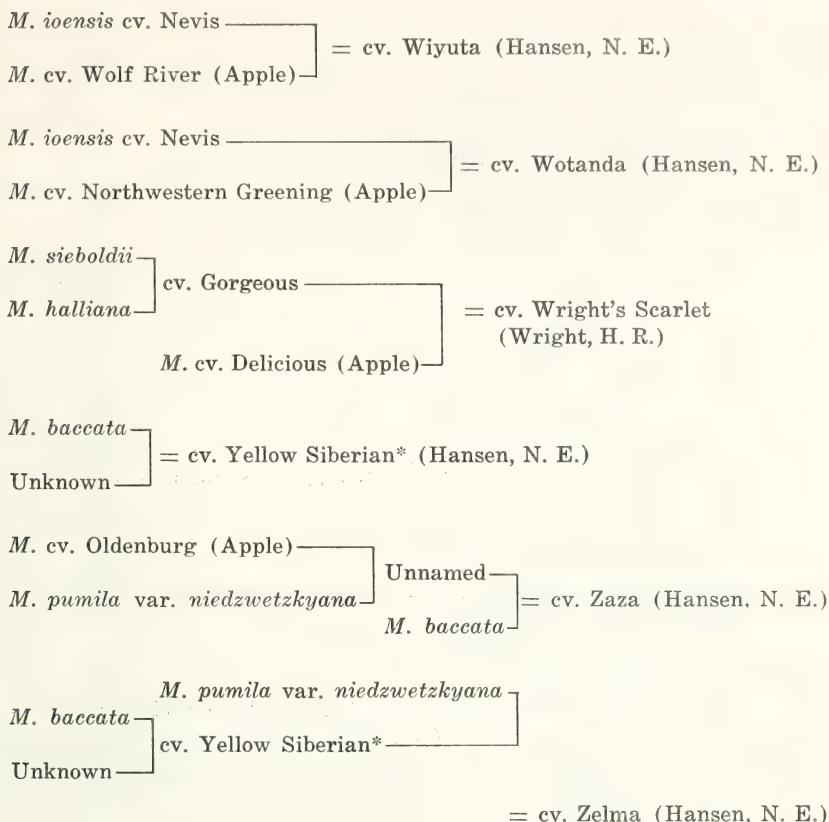
= cv. Whitney^{34, 35} (Whitney)

M. sieboldii var. *zumi* ————
 Unknown ————

= cv. Winter Gold* (Doorenbos)

³⁴ See footnote 16, p. 48.

³⁵ Grown from seed by A. E. Whitney, Franklin Grove, Ill.



Selected References

- (1) ASAMI, YOSHICHI.
1927. THE CRAB-APPLES AND NECTARINES OF JAPAN, pp. 1-55 and 78-86. Tokyo.
- (2) BEACH, S. A., BOOTH, N. O., and TAYLOR, O. M.
1905. THE APPLES OF NEW YORK. v. 1, 409 pp. and v. 2, 360 pp. New York State Dept. of Agr.
- (3) BOOM, B. K.
1965. NEDERLANDSE DENDROLOGIE. v. 1, pp. 275-280. H. Veenman & Zonen N.V., Wageningen.
- (4) BROOKS, R. M.
1964. REGISTER OF NEW FRUIT AND NUT VARIETIES. Amer. Soc. Hort. Sci. Proc. 85: 699-703.
- (5) ————
1965. op. cit. 87: 587-594.
- (6) ———— and Olmo, H. P.
1946. op. cit. 47: 544-547.
- (7) ———— and Olmo, H. P.
1949. op. cit. 53: 573-575.

- (8) ———and Olmo, H. P.
1950. op. cit. 56: 510-513.
- (9) ———and Olmo, H. P.
1951. op. cit. 58: 387-390.
- (10) ———and Olmo, H. P.
1952. op. cit. 60: 498-499.
- (11) ———and Olmo, H. P.
1953. op. cit. 62: 514-516.
- (12) ———and Olmo, H. P.
1956. op. cit. 68: 612-616.
- (13) ———and Olmo, H. P.
1957. op. cit. 70: 558-561.
- (14) ———and Olmo, H. P.
1958. op. cit. 72: 521-523.
- (15) ———and Olmo, H. P.
1959. op. cit. 74: 759-765.
- (16) ———and Olmo, H. P.
1960. op. cit. 76: 727-731.
- (17) ———and Olmo, H. P.
1961. op. cit. 78: 623-626.
- (18) ———and Olmo, H. P.
1962. op. cit. 81: 570-579.
- (19) ———and Olmo, H. P.
1963. op. cit. 83: 864-867.
- (20) ———and Olmo, H. P.
1966. op. cit. 89: 774-776.
- (21) DEN BOER, A. F.
1958. SOME OUTSTANDING OLD AND NEW VARIETIES OF FLOWERING CRABAPPLES. Iowa State Hort. Soc. Proc. (1956-57) 91: 56-59.
- (22) ———
1959. ORNAMENTAL CRAB APPLES. 226 pp. Amer. Assoc. Nurserymen.
- (23) DOWNING, CHARLES.
1871. DOWNING'S SELECTED FRUITS FOR THE GARDEN AND MARKET. pp. 76-264. New York.
- (24) ELLENWOOD, C. W.
1929. FRUIT VARIETIES IN OHIO. IV. CRAB APPLES. Ohio Agr. Expt. Sta. Bul. 434, 13 pp.
- (25) FISHER, H. H.
1963. A SURVEY OF APPLE CLONES IN THE UNITED STATES. U.S. Dept. Agr., Agr. Res. Serv. ARS 34 37-1, 324 pp.
- (26) HANSEN, N. E.
1927. PLANT INTRODUCTIONS 1895-1927. S. Dak. Agr. Expt. Sta. Bul. 224, pp. 6-17.
- (27) ———
1929. EXPERIMENTS IN PLANT HEREDITY. S. Dak. Agr. Expt. Sta. Bul. 237, 24 pp.
- (28) ———
1931. THE ORNAMENTAL TREES OF SOUTH DAKOTA. S. Dak. Agr. Expt. Sta. Bul. 260, pp. 28-38.
- (29) ———
1937. FRUITS, OLD AND NEW AND NORTHERN PLANT NOVELTIES. S. Dak. Agr. Expt. Sta. Bul. 309, pp. 7-9.

- (30) ———
1940. NEW HARDY FRUITS FOR THE NORTHWEST. S. Dak. Agr. Expt. Sta. Bul. 339, 31 pp.
- (31) ———
1944. FIFTY YEARS WORK AS AGRICULTURAL EXPLORER AND PLANT BREEDER. Iowa State Hort. Soc. Trans. 79, pp. 43-47.
- (32) HARRISON, R. E.
1967. HANDBOOK OF TREES AND SHRUBS FOR THE SOUTHERN HEMISPHERE. Ed. 4, pp. 226-229. New Zealand.
- (33) HEDRICK, U. P.
1922. CYCLOPEDIA OF HARDY FRUITS. pp. 15-75.
- (34) HOGG, ROBERT.
1875. THE FRUIT MANUAL. Ed. 4, pp. 4-170. London.
- (35) ———
1884. THE FRUIT MANUAL. Ed. 5, 759 pp. London.
- (36) JEFFERSON, R. M.
1968. FUJI—A NEW CRABAPPLE—AND OTHER DOUBLES. Amer. Hort. Mag. 47: 22-25.
- (37) KRUSSMAN, G.
1962. HANDBUCH DER LAUBGEHOLZE. v. 2, pp. 110-125. Berlin.
- (38) LESLIE, W. R.
1946. TREE FRUITS GROWN IN PRAIRIE ORCHARDS. Canada Dept. Agr., Morden, Man. Farmers' Bul. 135, 27 pp.
- (39) ———
1949. PLANT INTRODUCTIONS. Canada Dept. Agr., Dominion Expt. Sta., Morden, Man., Prog. Rpt. 1938-46, pp. 11-13.
- (40) McCRORY, S. A.
1958. PRELIMINARY EVALUATION AND DESCRIPTIONS OF DOMESTIC AND INTRODUCED FRUIT PLANTS. S. Dak. Agr. Expt. Sta. Bul. 471, No. Cent. Pub. No. 90, pp. 13-24 and 26-29.
- (41) NICHOLS, L. P.
1968. SELECTING DISEASE RESISTANT CRAB APPLES—1970. Pa. State Univ., Col. of Agr. and Home Econ. Ext. Serv. [Processed.]
- (42) OHWI, JISABURO.
1965. FLORA OF JAPAN. pp. 548-549. Washington, D.C.
- (43) PRESTON, ISABELLA.
1941. ROSYBLOOM CRABAPPLES. Canad. Hort. and Home Mag. 64: 93, 102.
- (44) ———
1944. ROSYBLOOM CRABAPPLES FOR NORTHERN GARDENS. N.Y. Bot. Gard. Jour. 45: 169-174.
- (45) RAGAN, W. H.
1905. NOMENCLATURE OF THE APPLE; A CATALOGUE OF THE KNOWN VARIETIES REFERRED TO IN AMERICAN PUBLICATIONS FROM 1804 TO 1904. U.S. Dept. Agr., Bur. Plant Indus., Bul. 56, 383 pp.
- (46) REHDER, ALFRED.
1915. In Sargent, C. S., *Plantae Wilsonianae*. v. 2, p. 294. Cambridge, Mass.
- (47) ———
1920. NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM. Arnold Arboretum Jour. 2: 47-58.

- (48) ———
1926. NEW SPECIES VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM. *Arnold Arboretum Jour.* 7: 24-28.
- (49) ———
1949. BIBLIOGRAPHY OF CULTIVATED TREES AND SHRUBS. pp. 267-276. Jamaica Plain, Mass.
- (50) ———
1958. MANUAL OF CULTIVATED TREES AND SHRUBS. Ed. 2, pp. 389-399. New York.
- (51) SARGENT, C. S.
1905-13. TREES AND SHRUBS. 2 v., illus. v. 1, pp. 35, 71, 191; v. 2, pp. 23, 225, 230. Boston and New York.
- (52) ———
1926. MANUAL OF THE TREES OF NORTH AMERICA. Ed. 2, pp. 379-389. Boston and New York.
- (53) SAUNDERS, WILLIAM.
1911. PROGRESS IN THE BREEDING OF HARDY APPLES. *Canada Cent. Expt. Farm. Bul.* 68, 14 pp.
- (54) SKIRM, G. W.
1939. BREEDING NEW VARIETIES OF ORNAMENTAL CRABAPPLES AT THE ARNOLD ARBORETUM. *Bul. of Pop. Inform. Arnold Arboretum* 7: 65-67.
- (55) SLAVIN, A. D.
1931. NOTES ON NEW FORMS OF MALUS AND CRATAEGUS. *Amer. Midland Nat.* 12: 363-364.
- (56) SNYDER, L. C., JOHNSON, A. G., and STADTHERR, R. J.
1957. NEW ORNAMENTALS FOR 1958. *Minn. Agr. Expt. Sta. Misc. Rpt.* 29, 4 pp.
- (57) ——— PHILLIPS R. A., and JOHNSON, A. G.
1962. A NEW FLOWERING CRABAPPLE. *Minn. Agr. Expt. Sta. Misc. Rpt.* 51, 2 pp.
- (58) SOUTH DAKOTA AGR. EXPT. STA.
1939. NORTHERN PLANT NOVELTIES FOR 1939. Brookings. [Processed.]
- (59) ———
1940. NORTHERN PLANT NOVELTIES FOR 1940. Brookings. [Processed.]
- (60) ———
1941. NORTHERN PLANT NOVELTIES FOR 1941. Brookings. [Processed.]
- (61) Van Eseltine, G. P.
1933. NOTES ON THE SPECIES OF APPLES. II. THE JAPANESE FLOWERING CRABAPPLES OF THE SIEBOLDII GROUP AND THEIR HYBRIDS. *N.Y. State Agr. Expt. Sta. Tech. Bul.* 214, 21 pp.
- (62) ———
1934. ORNAMENTAL APPLES AND CRABAPPLES. *N.Y. State Agr. Expt. Sta. Cir.* 139, 13 pp.
- (63) WISTER, JOHN.
1951. THE BEST IN FLOWERING CRABAPPLES. *Arborist's News* 16: 25-28.
- (64) ———
1955-56. SWARTHMORE PLANT NOTES. v. 1, part 1, pp. 107-121. Swarthmore, Pa.

- (65) WYMAN, DONALD.
1939. FLOWERING CRABAPPLES FOR SPRING AND FALL. Bul. of Pop. Inform. Arnold Arboretum 7: 25-31.
- (66) ———
1948. NEW OR RARE ORNAMENTAL PLANTS RECENTLY DISTRIBUTED TO COMMERCIAL NURSERYMEN BY THE ARNOLD ARBORETUM, Arnoldia 8: 54-56.
- (67) ———
1955. CRAB APPLES FOR AMERICA. 63 pp. Amer. Assoc. Bot. Gard. and Arboretums.
- (68) ———
1956. CRAB-APPLES FOR ORNAMENTAL FRUITS. Arnoldia 16: 29-32.
- (69) ———
1958. WHERE SOME OF THE CRAB-APPLES COME FROM. Gard. Jour. of the N.Y. Bot. Gard. 8: 122-124.

Appendix 1

UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE CROPS RESEARCH DIVISION

NATIONAL ARBORETUM

ADDRESS REPLY TO:
UNITED STATES NATIONAL ARBORETUM
WASHINGTON 25, D. C.

August 9, 1965

Dear Sir:

The National Arboretum is attempting to locate as many correctly named crabapple cultivars as possible, and would appreciate your assistance in this undertaking. To serve as a guide for this project, we are enclosing a list of 375 cultivar names and their originators or introducers.

Will you please compare this list with your records, and circle the name of each cultivar now growing in your collection that came directly from the indicated source.

From your list, and those received from others, we plan to compile, for further study, a master file of crabapple cultivars and their locations.

At a later date may we again request your assistance in helping us document this material?

Thank you for your cooperation.

Sincerely yours,



Roland M. Jefferson
Plant Taxonomist

Enclosure

Appendix 2

The following is a list of Crabapples and their introducers or originators. Please check your records and circle the cultivars in your collection that came from the indicated source.

Example: 'Acheson' (number 1 below) was introduced by W. R. Leslie of Dominion Experimental Station, Morden, Manitoba, Canada. If you have 'Acheson' from W. R. Leslie of the Experimental Station, Manitoba, Canada, circle no. 1. If you have 'Acheson' from any source other than W. R. Leslie, do *not* circle no. 1.

When you have finished, please return this list, in the enclosed envelope, to the U.S. National Arboretum.

Your assistance in this project is deeply appreciated.

NAME	ORIGINATORS AND/OR INTRODUCERS
1. Acheson	W. R. Leslie, Dominion Exp. Sta., Morden, Manitoba, Canada
2. Adam	W. S. Boughen OR Boughen Nurs., Valley River, Manitoba, Canada
3. Adams	Adams Nurs. Co., Westfield, Mass.
4. Alaska	Central Exp. Farm, Ottawa, Canada
5. Alberta	Central Exp. Farm, Ottawa, Canada
6. Alexis	N. E. Hansen, Exp. Sta., Brookings, S. D.
7. Almey	W. R. Leslie, Dominion Exp. Sta., Morden, Manitoba, Canada
8. Alpha	C. A. Terry, Crescent, Iowa
9. Alred	Exp. Sta., Morden, Manitoba, Canada
10. Ames	Iowa State College, Ames, Iowa
11. Amisk	I. Preston, Central Exp. Farm, Ottawa, Canada
12. Amsib	N. E. Hansen, Exp. Sta., Brookings, S. D.
13. Amur	N. E. Hansen, Exp. Sta., Brookings, S. D.
14. Anaros	Dr. S. Wheeler, Rosthern Exp. Farm, Saskatchewan, Canada
15. Angus	Central Exp. Farm, Ottawa, Canada
16. angustifolia 'Pendula'	T. G. Harbison, Asheville, N. C.
17. Ann Trio	N. E. Hansen, Exp. Sta., Brookings, S. D.

(Page 1 of 16 page questionnaire)

Appendix 3

ENCLOSURE:

Letter Dated May 2, 1966

From: Roland M. Jefferson
U.S. National Arboretum

To:

Subject: Crabapples received by various institutions directly from originators and/or introducers. (Follow-up to 1965 National Arboretum Crabapple Questionnaire)

The following crabapples were indicated by you on The National Arboretum Crabapple Questionnaire of August 9, 1965 as being of authentic origin: Your direct Sources as indicated by you for the crabapples listed in the preceding column:

1. Alney
2. Baskatong
3. Centennial
4. Chestnut
5. Evelyn
6. Flame
7. Irene
8. Pixie
9. Purple Wave
10. Radiant
11. Red Splendor
12. Sundog
13. Vanguard

W. R. Leslie, Dominion Exp. Sta., Morden, Manitoba, Canada
Central Exp. Farm, Ottawa, Canada
Dept. of Hort., Univ. of Minn., Excelsior, Minn.
Univ. of Minn., Excelsior, Minn.
A. F. den Boer, Des Moines, Iowa
Univ. of Minn., Excelsior, Minn.
A. F. den Boer, Des Moines, Iowa
A. F. den Boer, Des Moines, Iowa
A. F. den Boer, Des Moines, Iowa
Univ. of Minn., Excelsior, Minn.
Bergeson Nurs., Fertile, Minn.
W. R. Leslie, Dominion Exp. Sta., Morden, Manitoba, Canada
Univ. of Minn., Excelsior, Minn.

The above crabapple names and sources are accurate listings of living crabapples now in your collection that were received directly from the sources indicated. YES NO

If your answer is No Please make any changes, additions or deletions necessary to make this list accurate.

Your Name Date May 16, 1966
Please keep carbon copy of this enclosure for your files and return original to:

R. M. Jefferson
U.S. National Arboretum
Washington, D.C. 20250

Botanical Index

Names in all capital letters indicate that the plants are listed in this publication as being of documented authentic origin and their locations are given. Parentheses around pages numbers indicate main references. An (a) following a name in Section B indicates apple.

Section A:

Species, varieties, and related cultivars

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<i>C. yunnanensis</i> = <i>M. yunnanensis</i>	(24)
<i>Crataegus alnifolia</i> = <i>M. sieboldii</i> (var. <i>arborescens</i>)	(21)
<i>C. cavaleriei</i> = <i>M. sieboldii</i> (var. <i>arborescens</i>)	(21)
<i>C. taquetii</i> = <i>M. sieboldii</i> (var. <i>arborescens</i>)	(21)
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<i>D. yunnanensis</i> = <i>M. yunnanensis</i>	(24)
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<i>E. tschonoskii</i> = <i>M. tschonoskii</i>	(24)
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<i>Gymnosporangium juniperi-virginianae</i>	4
<i>Macromeles tschonoskii</i> = <i>M. tschonoskii</i>	(24)
<i>Malus adamsi</i> = cv. Adams	(25)
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<i>M. baccata</i> f. <i>gracilis</i> = <i>M. baccata</i> cv. <i>Gracilis</i>	(12)
<i>M. BACCATA</i> var. HIMALAICA	(12)
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<i>M. BACCATA</i> cv. JACKII	(12)
<i>M. baccata</i> f. <i>jackii</i> = <i>M. baccata</i> cv. <i>Jackii</i>	(12)
<i>M. baccata</i> cv. <i>Jenensis</i>	48
<i>M. baccata</i> var. <i>leiostyla</i> = <i>M. baccata</i>	(8)
<i>M. baccata</i> var. <i>mandshurica</i>	22
<i>M. baccata</i> var. <i>mandshurica</i> f. <i>zumi</i> = <i>M. sieboldii</i> var. <i>zumi</i>	22
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<i>M. CORONARIA</i> cv. CHARLOTTAE	(13)
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<i>M. coronaria</i> cv. Charlotte = <i>M. coronaria</i> cv. Charlottae	(13)
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<i>M. CORONARIA</i> cv. THOMS	(14)
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<i>M. floribunda</i> cv. Hillieri = cv. Hillier	(39)
<i>M. floribunda lemoinei</i> = <i>M. × purpurea</i> cv. Lemoinei	(19)
<i>M. floribunda</i> var. spontanea = <i>M. halliana</i> var. spontanea	(15)
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<i>P.</i> (malus) <i>zumi</i> = <i>M. sieboldii</i> var. <i>zumi</i>	(22)
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<i>P. subcrataegifolia</i> = <i>M. sieboldii</i> (var. <i>arborescens</i>)	(21)
<i>P. tschonoskii</i> = <i>M. tschonoskii</i>	(24)
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<i>P. baccata</i> Thun. = <i>M. sieboldii</i> (var. <i>arborescens</i>)	(21)
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<i>P. baccata</i> a. <i>genuina</i> = <i>M. baccata</i>	(8)
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<i>P. malus sargentii</i> = <i>M. sargentii</i>	(20)
<i>P. malus transitoria</i> = <i>M. transitoria</i>	(23)
<i>P.</i> (malus) <i>zumi</i> = <i>M. sieboldii</i> var. <i>zumi</i>	(22)
<i>P. microcarpa</i> = <i>M. baccata</i>	(8)
<i>P.</i> No. 4115A = <i>M. kansuensis</i>	(17)
<i>P. prattii</i> = <i>M. prattii</i>	(17)
<i>P. pulcherrima</i> var. <i>arnoldiana</i> = <i>M.</i> × <i>arnoldiana</i>	(8)
<i>P. sargentii</i> = <i>M. sargentii</i>	(20)
<i>P. sieboldii</i> var. <i>calocarpa</i> = <i>M. sieboldii</i> var. <i>zumi</i> cv. <i>Calocarpa</i>	(22)
<i>P. sp.</i> (Purdum No. 179) = <i>M.</i> × <i>robusta</i> cv. <i>Persicifolia</i>	(20)
<i>P. theifera</i> = <i>M. hupehensis</i>	(15)
<i>P. toringo</i> γ <i>integrifolia</i> = <i>M. sieboldii</i> var. <i>zumi</i>	(23)
<i>P. toringoides</i> = <i>M. toringoides</i>	(23)
<i>P. transitoria</i> = <i>M. transitoria</i>	(23)

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<i>P. yunnanensis</i> = <i>M. yunnanensis</i>	(24)
<i>Sinomalus toringoides</i> = <i>M. toringoides</i>	(23)
<i>S. honanensis</i> = <i>M. honanensis</i>	(15)
<i>S. transitoria</i> = <i>M. transitoria</i>	(23)
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